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Some Aspects of Distemper, with Special Reference to the Nervous Type.*

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I am conscious of the honour you have done me by asking me to read a paper before you, and my great anxiety now is that I shall acquit myself creditably. It was difficult to choose a subject likely to be the most interesting and acceptable to yourselves, but, bearing in mind the ever-increasing importance to the general practitioner of canine practice, I decided upon distemper.

Of all canine disorders, distemper still accounts for the greatest amount of sickness; it remains the most baffling disease with which one has to contend, and it is the one upon which no amount of discussion would appear to be superfluous. It happens, too, to be a malady which has claimed my attention particularly for years—a study which culminated three years ago in the publication of my book entitled "Canine Distemper."

What is Distemper?—It is not my intention to wade systematically through every aspect of the disease, but merely to discuss it from those varied points of view which have always been controversial. Firstly, what train of symptoms constitutes distemper? Must it necessarily be a mixture of discharging eyes and nose, convulsions, chorea, diarrhœa, pneumonia, and the other harrowing details, or may it be a more or less simple condition? Certainly when one *does* find these associated symptoms, one is fully justified in definitely diagnosing distemper. On the other hand, my contention is that plain, unadulterated distemper is purely a catarrh of any or all mucous membranes. Thus, we find rhinitis, conjunctivitis, preputial catarrh, relaxed bowels, and the rest, either separately or in combination. Usually these are accompanied by foul breath; loss of flesh; staring, harsh coat which readily falls; shivering; sleepiness; inappetance; huskiness, and a peculiar offensive odour of the body.

Diagnosis.—Very diagnostic is the faint, persistent, short, husky cough by which the animal endeavours to remove accumulations of phlegm, or allay pharyngeal irritation. In the commencement, only a soft, faint, oft-repeated cough may be produced, which gradually swells in intensity until it terminates in violent expulsive noises as though the dog were choked. The owner will usually say that the animal has a bone in its throat, or he may interpret this symptom as vomition.

The temperature is most unreliable as a diagnostic indicator, being sometimes normal, at other times high, but usually about 102.5°F.

The absence of pustules should not influence the diagnosis, as in my experience not more than about 12 per cent. of cases are associated with skin lesions. I have no hesitation in asserting that pustules are not a symptom of distemper *per se*, but are purely a secondary phenomenon which may or may not appear. If I ever encounter them, however, it has been my almost invariable experience that they usher in, coincide with, or follow an attack of distemper. Thus to a certain extent they are diagnostic of the disease. Last February, Major Dunkin, who is Veterinary Superintendent of the Field Laboratories of the National Institute for Medical Research, definitely asserted, in a paper read before the Central Veterinary Society, that vesico-pustules can no longer be regarded as a diagnostic sign of distemper in dogs. This conclusion appears to have been based upon the facts that some thirty-nine puppies were affected with vesico-pustules and failed to exhibit any constitutional symptom whatever; that all were still susceptible to distemper, or, in other words, that no immunity had been conferred. Answering the first point, it is not perhaps impossible that these puppies were, or had been, very mildly affected with distemper, though showing little outward sign. In fact, many writers have asserted that cutaneous distemper is a distinct type. Gray, for instance, in 1913 wrote concerning the exanthema of distemper, "Sometimes it is the sole external manifestation of the disease, and when the patient is kept under good hygienic conditions, the eruption may not be succeeded by any other symptoms or complications." Can it, indeed, be possible that the excellent hygienic conditions prevailing at the Field Laboratories, were responsible for suppressing any further manifestations of a disease which (in an animal leading a normal, free existence, exposed to all deleterious influences), would have developed its usual phenomena and run its ordinary course?

As to Major Dunkin's second point, it is hardly surprising that the onset of cutaneous lesions in these puppies failed to confer any immunity in the victims against distemper; because, if I am correct in stating that the exanthema is a *secondary* infection, it is not to be expected that such an infection would exert any influence against the *primary* infection. Further, it must be pointed out that a naturally-occurring attack of true distemper does not necessarily leave the patient immune against either one or more subsequent attacks.

In an article in the *North American Veterinarian* for August, Dr. Flynn positively states that one attack of distemper always affords the recovered animal permanent protection. Against this, I must just as definitely record that it does *not necessarily* do anything of the kind. Quite a number of instances

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have been encountered in which dogs have been treated on two or even three occasions for typical symptoms of distemper. Only last week my own office cat eventually recovered from its third attack of distemper in three years.

If the vesico-pustules which appeared in thirty-nine dogs in the Field Laboratories did *not* arise in consequence of a distemper infection, as Major Dunkin tells us, can we logically suppose that they arose as secondary symptoms of a disease which itself was not present? I think we cannot: thus we are forced back upon two conclusions,—first, that these vesicles actually were associated with distemper, or, alternatively, that they owed their origin to a totally different cause. Worm infestation and teething troubles were suspected as possible causes, but in referring to the tables published on pages 195-6 of the *Veterinary Record* (No. 9, Vol. 6) we find that twenty-one of the dogs were free from worms and that thirty-five had no dental troubles. Further, we read in the official report of the Distemper Council for February, 1926, that "It has for the first time become possible to study distemper in dogs uncomplicated by any of the numerous secondary infections"—which sounds as though there is a total elimination of staphylococci, streptococci, colon bacilli and all the other armies of secondary invaders. To what, then, shall we ascribe the origin of these vesicles? Personally, I think they were due to the distemper virus, although doubtless of a very weak strain. Thus, to sum up, I still feel that there is as yet insufficient evidence to justify one in saying that no relation exists between distemper and the vesicular eruption.

Now we are still on the question of diagnosis, one of the factors concerning which is the age of the animal attacked. It is generally conceded that the nearest analogy to distemper in human medicine is measles. This is almost essentially a disease of the young, but many exceptions to this rule occur, and we express no surprise to hear of old folk contracting and even dying from measles. In the same way, distemper can and does affect dogs of any age up to about six years. I have personally seen illness in a dog of that age which I could not clinically distinguish from distemper. It does not occur often, I grant, but it *can* occur, and we are not justified in expressing the opinion that any given attack cannot be distemper because it happens to affect an aged animal.

Suppressed Distemper.—Many veterinary surgeons have deplored the fact that there is no known pathognomonic syndrome for distemper. The difficulties are fully realised, yet I think that we can at least agree that a dog suffering from a husky cough, nasal discharge, and diarrhœa, is a definite case, for these three symptoms do not occur simultaneously in any other canine disease. They are also the most *constant* symptoms encountered in distemper, and therefore the most diagnostic. There is another type of case, quite frequently encountered, in which the subject exhibits an unaccountable emaciation, lack of interest in food, unwillingness to play, and intermittent attacks of diarrhœa, with occasional emesis. There is nothing very definite about such a case, but when I meet with one I always suspect distemper, and in most instances eventually find I was right. But it may be several weeks before more definite or characteristic symptoms set in. That is the peculiar feature about distemper—the way it will hang about for weeks, partially suppressed, the symptoms disappearing for a time and then returning with renewed intensity. Often when a dog has been mysteriously out of sorts and then apparently recovers, it is only necessary to give the animal a bath or take it for a long walk to bring about a rapid return of his old trouble and induce the onset of typical symptoms of distemper.

Period of Incubation.—In the official report of the Distemper Council I noticed that an incubation period was definitely fixed at four days. This observation does not at all coincide with clinical experience. In practice, very varying periods are known to elapse between the infection and the first appearance of symptoms. The minimum and maximum periods—as you all know—are computed by practitioners at three days and three weeks respectively. Very much often depends upon this question, and it is in the interest of the general practitioner to be quite clear upon the matter. Take, for instance, the case of the owner who leaves an apparently healthy dog with a veterinary surgeon to board for a fortnight. After nine or ten days it develops distemper, and the owner probably consults another veterinary surgeon as to the incubation period. If this is rigidly stated to be four days, then the obvious inference is that the infection was contracted in the veterinary surgeon's kennel, and he is held liable. The same difficulties arise in connection with the purchase of dogs, and should a valuable dog exhibit evidence of the disease soon after purchase, the legal position must to a large extent hinge upon the period of incubation. In my own experience this period is, on an average, seven days; but cases have been known in which the date of known contact between a healthy and a distempered dog was some twenty-one days before symptoms developed in the healthy dog. There are many factors which will influence the incubative period, such as the virulence of the attacking organism, the breed of dog, its resistance or degree of immunity, the physical condition of the dog, and the dose of virus communicated. Most probably, under experimental conditions, all these factors are more or less standardised, thus accounting for the absence of any appreciable difference between the incubation period observed in all the dogs which were under Major Dunkins' care.

Method of Infection.—In my book on Distemper, I upheld the opinion that the disease was not only spread by ingestion, but by inhalation. All authorities seem agreed that natural infection would arise from *ingestion* of the contagium, but many consider that its inhalation plays no part in its spread. To quote the book—"My view is that the majority of cases of distemper arise through inhalation of the contagium, either by droplet infection or by aerial

infection. In the former method, the bacillus or its toxin is conveyed through the atmosphere as, or in, small droplets of sputum which have been thrown into the air during the act of coughing or sneezing; and which remain suspended for some time. By aerial infection the contagium is transported through the air by means of small dust particles. Distemper can be as easily spread in this way as can tuberculosis, through the drying up and dissemination of sputum, nasal discharges, &c." Now, this belief appears to have been confirmed by the scientific report of the *Field* Distemper Council which, in the February issue for 1926, says this:—"It has been found necessary to place dogs suffering from distemper in individual kennel runs situated out of doors at some distance from each other . . . because there is evidence that the infection may be passed from one animal to the other through the air in confined places."

To he who conducts an animal hospital or boarding kennels, this matter will assume great importance, and it is well to arrive at some definite conclusion, for the sake of all concerned. It has, indeed, been suggested that distemper arising from inhalation was the direct cause of respiratory symptoms, whilst ingestion brought about alimentary symptoms. On the surface, this seems reasonable, but it would require a deal of proving.

Nervous Distemper.—To the majority of veterinary surgeons, probably the most trying and hopeless cases of distemper are those complicated by nervous symptoms. Some attacks of the disease mark their onset by purely nervous phenomena unaccompanied by any other sign. Thus we may find a dog behaving strangely, such as by hiding away, becoming unusually frightened by strangers or noises; later, by having mild convulsions of short duration, but which may eventually assume alarming proportions. In other cases, the first sign may be a paresis, or loss of power of the limbs; whilst, in yet others, we may see clonic spasms of individual muscles or groups of muscles. In all these types of case, if the owner and his veterinary adviser are not too impatient, and will refrain from resorting to the lethal chamber, they will find after the lapse of some days that other symptoms are setting in which give them a clue as to the real nature of the malady.

Nervous symptoms are variously observed to precede all other symptoms, to occur during the course of the malady, or as a termination. Even some months after supposed complete recovery, cases have been recorded in which nervous sequelæ have arisen. Their etiology seems to remain more or less obscure, although several theories have been advanced. For instance, going back a long way, Youatt considered that an inflammation of the eye or of the nose might, from very proximity, soon be communicated to the brain, probably *via* the cribriform plates. Blaine says:—"It is not unlikely that in some few cases a true metastasis occurs." McGowan intimated his opinion that "complications were due to the spread of the distemper organism to other parts . . . and chorea appeared to be due to an extension of infection from the middle ear, or roof of the nose, to the meninges, thereby causing a meningitis. He had observed three such cases, in one of which a scanty growth of the distemper organism was obtained pure from the brain, and a histological examination of the brain showed the presence of a meningitis. He would place all the various paralyses that occur in distemper in the group of complications attributable to toxins. In seven cases of this kind, all of which were of the nature of paraplegia, histological examination showed a small-celled infiltration of the vessels and grey matter of the cord, a condition indicating poisoning of the cord by some toxin. Cultures made from the cord were sterile."

Hutyra and Marek were of opinion that "the specific distemper virus causes an early involvement of the nervous system by the development of degenerative changes in the brain and spinal cord, which in some cases are manifested by striking nervous symptoms."

Cases of distemper may begin with great depression and dulness; there is a marked apathy, and sometimes even deep coma. This early listlessness and general prostration undoubtedly arise from a lack of healthy nervous energy. Coma may in a great many cases be accompanied by periods of excitement, nervousness, yelping, and even true delirium, succeeded again by marked depression. These disturbances may prove to be the *only* manifestations of nervous disorder; or, as I said above, we may observe clonic muscular spasms such as of the lips, cheeks, masseters, temporals, etc., followed perhaps by epileptiform convulsions. Since clonic spasms of the muscles of mastication produce an automatic rapid opening and closing of the mouth, the saliva is whipped into foam, and this so-called "foaming at the mouth," combined with the convulsive movements of the whole body, may lead one to suppose that the animal is in a fit. A true epileptiform seizure, however, implies loss of consciousness. As a rule, these nervous phenomena are not regarded as evidences of an approaching attack of distemper, expecially as symptoms suggestive of the disease, such as catarrh of the eyes and nostrils, may not appear until from one to three weeks afterwards.

An occasional sequel to distemper is the production of meningitis, which, among other causes, may be directly due to an extension of inflammation from neighbouring structures to the meninges. In some cases symptoms occur that indicate irritation of the nerves at the base of the brain—such as strabismus or squint, ptosis or drooping of the eyelid, optic neuritis, facial paralysis, muscular spasms, etc.

In this connection, it is interesting to note that ptosis and strabismus are also complications of measles. Dogs are liable to all these affections, though they are seen but rarely. More commonly, they are stricken with chorea, which apparently is an interrupted or intermittent supply of nerve force to the muscles, which is attended with irritability and depression, or with mental impairment. When the intensity of the spasms increases they are noticed equally well during

sleep as when awake ; in fact, they often become so violent and continuous as to prevent the animal from sleeping, and so exhaust the patient that death eventually ensues. In the human being it is most common amongst children, and is closely associated with acute rheumatism ; in many cases, also, the heart shows signs of an endocarditis similar to that observed in acute rheumatism. Chorea is not necessarily fatal, and may, after a lengthy duration, gradually diminish, and finally pass away, though unfortunately it has a tendency to increase in severity and terminate in fatal convulsions. Dogs sometimes live for several years affected with chorea, which then may or may not disappear entirely ; thus it is an imprudent and faint-hearted procedure to abandon all hope of recovery and condemn a dog to an untimely death, especially where the animal is of considerable value, either in a sentimental or a monetary sense. A poor man might probably be well advised to follow such a course, in view of the very problematical prospects of a complete return to usefulness, and the cost of administering treatment over a protracted period ; also, in arriving at a decision, the possibility of a paralysis supervening must not be lost sight of—the animal becoming a complete or partial cripple.

Chorea affecting any muscle or group of muscles *may be* succeeded by paralysis of those parts, extending ultimately, perhaps, to generalised paralysis, coma, and death. By judicious treatment, however, it is often possible considerably to lessen the spasmodic activity and its injurious effects, by enhancing the general tone of the nervous system and building up a strength which might, even permanently, overcome the morbid condition.

It has been said that the name chorea, as applied to this affection of dogs, is a misnomer, as the movements (incessant snapping of jaws, twitching of eyelids, and jerking of the head from side to side) are not of the same order as those in chorea of children, but are indicative of cortical irritation. In true chorea of man there is found no pathological alteration of the brain ; anæmia is present, and spasms are not confined to special muscular groups, but various muscular centres of the body are implicated. Chorea in dogs, although it might possibly exist independently, is very constantly associated with distemper, and, in fact, is declared by some to be absolute proof of the present or previous existence of that disease. Nevertheless, it is seen also in myelitis of traumatic or other origin, and as a result of abscesses and tumours contiguous with the brain, etc. In distemper, its most probable etiology is the action of bacterial toxins on the grey matter of the spinal cord, for the inferior horns have been observed by some to be thickened or hardened. Carougeau, Bohl and Rexter noted an infiltration of leucocytes in the grey matter of the entire cord, especially in the inferior horns.

Cases are not unknown in which affected dogs develop a tendency to move in a circle, walking or trotting round and round, always one way, (usually to the left) and quite oblivious to their surroundings or the voices of those they know best. Another curious manifestation is that in which the animal, when in a recumbent position, appears to be running as fast as it can, all legs being in progressive motion, and the dog simultaneously whining or moaning. In both conditions the brain is apparently implicated, and both are always extremely ominous.

Paralysis is a diametrically opposite condition to convulsions, and may be described as a loss of motion or sensation in a living part or member. A distinction must be drawn between paralysis or entire loss of movement, and paresis or partial disability, as evidenced by lameness or weakness. As regards the origin of complete paralysis, the various parts of the body are controlled by certain centres in the brain, and any disease or abnormal condition which becomes located in this cortico-muscular brain centre, and inflames or inhibits the power of these centres, must involve a paralysis of the muscles which they control. These provocative lesions may owe their origin to traumatism, inflammation, or the compression caused by inflammatory exudates, or actual degeneration of the tissue itself. Paralysis is a frequent symptom of rabies, though somewhat rare in distemper.

Paraplegia is a paralysis of the hind legs and hinder part of the body affecting both motion and sensation, the condition being indicative of disease or injury of the spine. The dog remains strong and active on its fore parts, but, owing to the debility or total disability of the hinder parts, it totters during progression, or may drag the inert remainder of his body after him.

Hemiplegia is also occasionally observed in association with distemper. None of these paralytic states need be regarded as necessarily fatal, and indeed they often prove to be only temporary conditions, but I hasten to disabuse you of any idea that they can be lightly regarded, since even where voluntary control of the muscles is regained there is always a possibility of permanent muscular atrophy limiting power and creating disfigurement.

Atrophy.—Where the condition is comparatively quickly amenable to treatment, little or no atrophy takes place, and the same may be said of paralysis arising from a cerebral source. Muscular atrophy, however, is a feature of spinal paralysis, and the degree of diminution (or wasting) will be an indication of the duration of the disease.

Other phenomena occasionally noticed as sequelæ are loss of sight, hearing, smell, and even voice ; mental deficiency and respiratory whistling. What has always proved a fatal symptom is the very distressing condition known as opisthotonos, in which the head is bent over the back by tetanic spasm. It is attended by partial or complete unconsciousness, the animal being unable to feed, and the rigid contortion is maintained for hours and sometimes even days. In my experience it has always terminated in deep coma and death, the patient's temperature being subnormal and the pulse hardly discernible.

Arising in connection with toxic diseases such as distemper and rabies, one sometimes, though rarely, observes cases of spinal meningitis, in which the pia

mater is the membrane most affected, and paralysis is occasioned—chiefly of the posterior extremities, but sometimes also of the anterior. Consciousness is practically never lost, but hyperæsthesia may be marked, the animal constantly gnawing at certain parts of its body, and the penis in a constant state of erection. Owing to contraction of the sphincters the evacuation of urine and fæces may be impeded; and the animal will howl, or show other evidence of pain when touched, especially along the back.

At later or more serious stages the sphincters of the bladder and anus may also become paralysed, and the animal be subject to incontinence. If and when the animal becomes moribund, the skin, when gathered up in one's hand, remains so for a few minutes, having lost all its power of contractility, and this is always to be regarded as a very ominous sign.

HANDLING THE CLIENT.—I think I have touched upon all the nervous conditions which are concerned with or likely to be met in distemper patients, and they constitute a formidable list. Now, when a practitioner is confronted with a case of nervous distemper, he has to make up his mind as to the manner in which he will advise his client, and, in the majority of cases, upon *his* decision rests the immediate fate of the dog. I want to make a strong plea to veterinary surgeons not to be so precipitate in advising destruction of such patients. There are many grounds upon which I base this appeal, and foremost among them is that of clinical research. Nothing can be tried, and no headway whatever can be made in our efforts to discover either cures or methods of alleviating disease, if the veterinarian shakes his head dolefully and thinks of nothing but the lethal chamber. It is not the way to advance our knowledge, but leaves the malady—as hitherto—an incurable one. Secondly, professional reputations are quite easily won or lost according to the way they may diagnose and dispose of such cases. One man may say "Oh! the case is hopeless, and destruction is the only way out." I have had personal knowledge of not one, but several instances, in which the owner, not feeling satisfied, has sought another opinion, and been considerably relieved to learn that there was still a chance. He has taken the chance; the dog has eventually recovered, and the first man's reputation has been shattered, among a probably-wide circle of people. The best way to handle such a situation, when dealing with a supposed hopeless case, is to point out the possibilities of recovery, the estimated time required to effect it, and the approximate cost in trouble and money.

Express willingness to render every help and exploit every avenue of treatment, and leave the owner then to consider his position. It is not suggested for one moment that one should embark upon several weeks' or months' patient treatment of a very young pup, or grown dog, which has *no* pecuniary and very little sentimental value. But so many of the dogs which are brought to me are either pedigreed animals or very great pets, and I know their owners are delighted to be told there is *some* chance for them, and usually readily agree to shoulder the expense of my treatment, or the trouble of treating the animals at home under my instructions. We talk very glibly of the need for educating the public to a better sense of the value of the veterinary profession; we want them to recognise the depth of our training and to appreciate our assistance. I say, then, that the clinician, on his part, will do none of these things by exhibiting an almost complete ignorance when confronted with something out of the ordinary. The cat's meat man or the "quack" can advise destruction of an animal, and pocket a few shillings for the advice. But the enlightened surgeon must do more. I believe in discussing the various methods of treatment and their possibilities with the client, citing perhaps some previous experiences, and generally treating him as a knowledgable person capable of grasping the situation. You might leave him with the impression that you certainly know your subject and he would come to give greater respect to your views, whatever they were. We cannot perform miracles, but we certainly can assist Dame Nature to effect recoveries—if we only will.

TREATMENT.—As to treatment of distemper, I am not a great believer in medicines, except for the alleviation of relievable symptoms such as continuous emesis, convulsions, or excessive diarrhœa, etc. When cases are of the ordinary, common type it is my general practice to offer no medicines—unless, as I have said, there is some outstanding distressing symptom which demands attention. I order strict captivity, as much sleep as possible, warmth, good hygiene, the best of nourishing food, and allow the malady to run its course. I still get 75 per cent. of recoveries under this plan, as would be obtained if cough and fever mixtures, tonics, etc., were freely poured down the animal's throat. In fact, I consider so much dosing worries a sick dog and acts detrimentally to its prospects. One's efforts to administer even liquid nourishment often cause more than enough struggling when dealing with an obstinate dog.

As I have made special reference to nervous distemper, I will outline the procedure usually followed in this type of case.

Convulsions may usually be checked by the use of narcotics, and I know of no better agent for the purpose than chloretone, which may be given in large doses at first, then gradually reducing the amount as the symptoms are allayed. Of course, enemas and purgatives should be given and cold water applied to the spine and back of the neck. For a particularly severe fit which one wishes to subdue at once, chloroform inhalation is quite the best, morphia, I find, having no effect. In cases in which it is difficult to administer by the mouth it is sometimes possible to administer *per rectum*. Syrup of chloral may be given *per rectum* in gum mucilage in doses of 15 to 60 m. and this is the only real narcotic of any use in cats. I read in one of the American veterinary journals some time ago, an account of the great value of barbital (also known as medinal and veronal). Given

intravenously, it is said to have a wonderfully quietening influence. I tried to find the article before coming down here, but failed. Luminal soda is another salt which finds great favour in America. So far I have not personally put these remedies to the test, so cannot speak from experience of them. It was, at the same time, thought advisable to bring them to your notice in case some of you might wish to experiment. Mayall wrote an interesting article in the January number of the *Veterinary Journal*, upon the use of luminal soda in canine practice. He cited a number of cases in which the drug appeared to effect a marked benefit to convulsed dogs. A light, easily digested diet, perfect quiet and semi darkness, and free action of the bowels, are auxiliaries in the treatment of fits.

Chorea may be dealt with in two ways, that is, by the administration of sedatives or of tonics. Some severe cases may demand the use of sedatives for awhile, but I make a practise of giving tonics as soon as ever it is possible. Of sedatives, one has a wide choice, the most useful agents being chloretone, chloral, sodium cacodylate, sod. bromide, aspirin, and camphor, probably in that order of value. Sodium cacodylate contains 35 per cent. of basic arsenic, and 10 grs. of it is equal to 5 grs. of arsenious acid. Those who read American veterinary literature will know that sod. cacodylate is highly prized in the treatment of chorea. In fact, Lacroix gives intramuscular injections every five days, starting with 5 grs., then 10 grs., 15 grs. and so on until a dose of 25 grs. has been reached. He says three or four doses will suffice in the average case to effect marked improvement; but if no beneficial results are then derived, it is unlikely that any improvement will ever take place. My own method is to give strychnine for a month or two, allowing intervals to elapse to guard against its cumulative effects. The best hygienic conditions are maintained, stress being laid upon the importance of sunlight and nourishing food. You may remember the case I published just recently in the *Record*, of a spaniel suffering from anterior and posterior paralysis, incontinence, blindness and chorea. One might be justified in describing this as a hopeless case and the majority of practitioners would probably have destroyed it. It lives, however, to-day, and apparently enjoys its life, little more than a slightly unsteady gait being discernible. Its treatment lasted just three months, but the animal was in my infirmary for only seventeen days of that period; thus the cost to the owner, of treatment, resolved itself into occasional visits, telephonic advice, and medicine. It is unnecessary to relate all the details of the treatment adopted, but I may say that I resorted to most known methods, including organotherapy and electricity.

Liquid parathyroid extract was given for twelve days, but it is almost impossible to know whether this substance was directly instrumental in bringing about resolution, as I was using other things simultaneously. When galvanism was tried, it is certain that the paralysis commenced to abate, and the owner told me that its effects were noticeable day by day. Sunlight, too, was never wasted, and it was nearly always possible to expose the dog for one to six or seven hours a day.

This brings me to the question of ultra-violet rays and its use in sickness of many kinds. I installed a Tungsten apparatus in my surgery some three months ago, during which I have, however, had opportunity of testing it in only one case of paresis. The animal was a greyhound which was almost unable to stand up, and had been in that condition for several weeks, tending to become worse. I shaved the greater part of its body and exposed it to the rays for twenty minutes daily for eight or nine days and gave it Easton's syrup twice daily for three weeks. At the end of that time it was quite recovered. I am aware, of course, of the futility of estimating the value of any treatment upon observations in one or two cases, but it is generally known among medical men that the absorption of ultra-violet ray undoubtedly imparts added vitality and tone to the system, stimulates the trophic centres and the functioning of the endocrine glands, and hence nutrition. Stainton, however, has been irradiating some of *his* patients, and his recent report in the *Veterinary Journal* is quite encouraging. Major Perry, too, read a paper before the Royal Society of Medicine, upon "Ultra-violet Rays for Animals," and expresses himself as delighted with his results. For paralysis, though, he seems to have resorted mostly to high-frequency currents, and with success.

Frick and Bullard, of the Kansas State Agricultural College, have been using ultra-violet rays for a considerable period upon diseased animals, and they reported last Christmas that of eight typical cases of canine distemper treated, five recovered in from two to four weeks. Three dogs not given the ultra-violet treatment during the same period, died. The diet in chorea is important, and I favour raw beef with its fat, raw milk, raw eggs, and cod liver oil. Meat is substituted sometimes by boiled cod, either whole, or mashed with milk.

This concludes my sketchy and somewhat tedious paper, gentlemen, and I greatly regret that I have not been able to come down with news of a discovery of the etiology of distemper, or with some infallible specific treatment; but I do think I have raised questions which are capable of useful discussion, and many new facts often come to light in discussions. I thank you for your attention.

Discussion.

In opening the discussion, Major E. S. Martin, of Christchurch, who was presiding in the absence of the President, Major J. S. Wood, of Parkstone, remarked that the subject of Captain Kirk's paper was one of far greater importance than might be realised. Distemper in dogs should, he considered, be dealt with far more from the point of view of preventive medicine. Thousands of valuable and highly-prized dogs were sacrificed yearly to this disease, and there was no legislation to cope with it, such as there was for the prevention or checking of other

epidemic diseases of animals. It was the despair alike of the dog owner, the dog lover, and the dog's physician, and he was sure they would agree with him when he said there was no pleasure in going to treat a case, because of the dread that one might carry the infection to other dogs, although this was extremely unlikely if reasonable precautions were taken. There was always the uncertainty, too, as to whether complications or sequelæ would ensue. Should not distemper in dogs be classified as a notifiable disease and the owners of dogs suffering from it or suspected to have it be made to isolate their sick animals? Was it not an act of cruelty to allow an infected dog to wander about the streets spreading the disease to other dogs? Many years ago, before he joined that Society, he wrote to an organisation concerned with the welfare of animals upon this very point, and they merely replied that if he would produce concrete evidence of such a case they would undertake a prosecution. What he wanted them to do was to use some of their funds to educate the public by newspaper propaganda to avoid such acts. Let them act up to their College motto and prevent disease from coming. Let them face the facts. They had not mastered this disease and there was no specific cure, and preventive measures should, therefore, be adopted. Of what use was it to treat the symptoms if they had nothing directly antagonistic to the disease itself?—although they hoped this would be discovered as a result of the labours of the ***Field*** Distemper Research Committee.

Captain ROCKETT expressed thanks to Captain Hamilton Kirk for his paper, to which he was sure they had all listened with much interest and pleasure. With regard to pustules, they frequently got them in distemper, and if he saw them he should certainly be on the look out for the disease, but they often got them apart from distemper. He certainly agreed they could have distemper twice, but he believed Captain Kirk said his office cat had had it three times. He would like to know whether there was any distinct connection between distemper in cats and distemper in dogs, because he had always regarded them as two separate complaints. With regard to chorea, he believed it was a recognised thing to give a purgative when a dog exhibited nervous symptoms, but he himself was rather hesitant in doing so, for the reason that if they gave a purgative they often set up diarrhœa, which they might find difficult to control afterwards. He quite agreed, however, that the best treatment was a tonic treatment and not a sedative one.

Colonel CARRELL asked Captain Kirk for his views on inoculation. He had been doing it himself, he added, for about twenty years, but he would rather like to know if Captain Kirk had any experience of it.

Mr. RIPLEY asked if Captain Kirk could enlighten them by differentiating the symptoms of acute nervous distemper from those of rabies.

Mr. CAUDWELL wished personally to thank Captain Kirk very much for his extremely interesting paper. With regard to the initial symptoms of distemper, he must say they were very confusing, but whenever he had a case where he had the slightest suspicion, he at once suggested isolation and awaited developments. When a dog was in a fit, injection of ether *per rectum* was very good, or one could try an injection of ether subcutaneously. He believed Captain Kirk had said something about opisthotonos and the use of strychnine. He rather avoided giving strychnine to dogs, because he considered it was very risky.

Mr. FACER said he wished to add his thanks to Captain Kirk for so kindly coming down to give them his paper. He knew he was a very busy man in London, and it was very kind of him to take all the trouble the preparation of such a paper must have involved, to say nothing of his kindness in coming down that day to read it to them. (Applause.) With regard to the period of incubation for distemper, he thought they ought to determine, if they could, what were the initial symptoms of the disease, because it was impossible to determine the period of incubation unless they knew the initial symptoms. Were they for instance, to take the rise in temperature as an initial symptom? He thought in every case there was a great rise in temperature the first day, but unfortunately, in many cases, they did not get the animal soon enough to know it. With regard to what Captain Kirk had said about chorea, he had an interesting experience in connection with a retriever. The dog had pneumonia, but no other complications, as far as he could remember, and it left the animal with very bad chorea in the left hind leg. This went on for about four years and so he asked the owner to let him see what he could do. He gave the dog arsenic in large enough doses almost to poison, but not to kill, and the dog had now apparently recovered.

Mr. MOFFAT, after adding his quota of thanks to Captain Kirk, remarked that he had used arsenic a good deal for chorea and had found very good results from it. He did not claim to be a canine specialist, but he agreed, as far as his comparatively small experience went, that the Asquithian policy of "wait and see" was the best in all these cases of distemper, but they must, of course, have good food and hygienic conditions.

Mr. GORTON thought Captain Kirk had not mentioned one of the best treatments for chorea, and that was rest and quietness. Reference had been made to chlorotone, but he understood that was a proprietary drug, and he would like to know what it was and how it acted.

Mr. PACK, while thanking Captain Kirk for coming down and giving such a splendid address, remarked that he had come to the conclusion they still had a tremendous lot to learn about the treatment of distemper. He agreed with the essayist that very often the less medicine they gave the better. His idea was to build up the system so that the dogs could live down the disease. It also depended a lot on the class of animals they got affected. The short-nosed ones were, he found, very bad patients, but, on the other hand, if they got a good old hardly terrier or sheep dog they frequently pulled through without any treatment at all. With regard to the first symptoms, he wondered who was going to detect them, but he agreed that there were certain symptoms which ought to put the veterinary surgeon on his guard. Something had been said about dogs losing chorea entirely, and he had known of cases where a change of air had sometimes resulted in this.

Major MARTIN thought the thermometer was a valuable guide in the diagnosis of this complaint in its early stages. His experience was that the temperature invariably averaged 103°F. Then, again, the prevention of the disease by inoculation raised a very open question; there were so

many different views as to its advisability. The difficulty was that they could not guarantee any of the preventive inoculations. One which he used when he first adopted them, appeared to produce all the symptoms of distemper, a condition which the manufacturer attributed to the development of the negative phase.

In voicing the thanks of the meeting to Captain Hamilton Kirk, the Chairman said he was sure they had all greatly enjoyed his excellent paper, and the discussion had brought out many points of interest.

Mr. PACK seconded, and the vote was carried by acclamation, and briefly acknowledged by Captain Kirk, who observed that if he had helped them in any way he was only too pleased.

THE REPLY.

Replying to the discussion, Captain Kirk said: In the first place, I would like to assure you of the very great pleasure it has given me to come down among you this afternoon. It is my first visit to the Southern Counties' Division, and I hope it will not be the last (Applause), for you have shown great leniency and have given me a very hearty welcome. After I had written the paper and read it through, I must say I was very disappointed with it, but there was no time to pull it to pieces. It seems, however, to have provoked a good discussion, and that, in the main, is what I wanted to do, as an interchange of opinions is very valuable.

Major Martin considers that some preventive measures against distemper should be in vogue and that the disease should be notifiable. It is some two years ago since I brought the very same proposals before the Central Veterinary Society, and the Kennel Club Council of Representatives. Before the latter body, I asked that no exhibitor of a dog at a show should gain access to the benches unless he had obtained from the inspecting veterinary surgeon a disc proving that his dog had been examined, as so many dogs escaped observation. This was turned down on the score of "wastage of time." I asked them to change the wire partitions between the exhibits for sheet metal ones to prevent nasal contact, draught and noise. This was adopted and obtains to-day. The suggested notifiability of the disease was discussed at length by the "Central" and whilst the members were in favour of the principle, they thought it impracticable, largely because of the difficulty of definite diagnosis.

I cannot agree with Major Martin that the thermometer is a reliable guide to diagnosis. The temperature in distemper is ever variable and shows no characteristic difference from that obtaining in any other inflammatory disease.

As to his failure with one vaccine, it it not surprising that such failures occur, because there are so many factors which influence, adversely or otherwise, the results obtainable. First, there is much in the choice of a vaccine; all kinds exist, but one must be reasonably sure that it is prepared from the causal organism. I have used a number of them, but place greatest reliance upon Parke Davis's bacterin. It is certain that the *Bacillus bronchisepticus* is consistently found in cases of distemper, and even if we concede that this organism is a secondary invader, then why not immunise against it? It is the secondary organisms which appear to do the greatest damage; then protect against them. The dosage, the reaction produced, and the state of the dog's health at the time of inoculation are all factors to be carefully studied. A collie was brought to me one day for inoculation and it looked the picture of health. As a precaution, its temperature was taken and found to be 105°. Had this precaution been overlooked, any untoward result would probably have been blamed to the vaccine. Exposing the dog to infection during the inoculations is calculated to confer the disease upon it with certainty, as the negative phase renders the animal more susceptible than he was before.

Captain Rockett asks the distinction between distemper of dogs and that of cats. The main one is that they are not intercommunicable and that distemper of the cat is nearly always of the catarrhal and rarely of the nervous type. He further asks whether a hound or other sporting dog could be worked with chorea. I think that if the cerebral lesion was mainly healed and the twitching only slight, the dog probably could be worked. It might, in some severer cases, however, intensify the symptoms to some extent during the hours of excitement and activity, and render the dog useless for its purpose. I cannot see why Captain Rockett should fear to give a purgative in nervous cases. In theory, I know of no reason why such should not be done, and, in practise, I think a purge is frequently necessary, especially in paralytic cases where there might be a stasis or weakness of the bowel. One need not, however, employ anything stronger than a laxative; in fact, liquid paraffin often suffices to meet all needs. Captain Rockett is afraid of strychnine, and if he has had accidents with it I am not really surprised, in view of its nature; yet I have consistently used it for fifteen years and can honestly say I have never had any trouble. Maybe I am lucky, but I think it is important to add that I only prescribe it in pill form and never as a liquid. In the latter form it is more quickly absorbed and much more potent. Messrs. Hewlett and Sons make an Easton's pill for me containing 1/60th gr.; and another, containing 1/120th, which I give to cats.

I can give one, two or three of these pills according to the breed and age of animal. I feel certain there is no other drug which can exert the same tonic effect upon the nervous system, and, so far, I have had no cause to abandon it. Mr. Ridley asks me to differentiate the nervous symptoms of distemper from rabies. I have never seen a case of rabies, but I should say the outstanding difference would be the propensity of the rabid animal for swallowing all kinds of foreign bodies, and for snapping at imaginary objects in the air, chewing chair legs, etc., all of which would be highly unusual in a case of distemper. Mr. Caldwell suggests that strychnine poisoning might have been mistaken for the opisthotonos of distemper. I suppose that, in fact, is true; but the opisthotonos of distemper is accompanied by periods of unconsciousness, which, I believe, is not the case in strychnine poisoning; also, the spasms of the latter are clonic. The case he cited of the dog with petechiæ on various parts of its body, yellow discoloration of the mucous membranes of the mouth, etc., was, I consider, one of leptospiral jaundice, especially in view of the hæmorrhages found on *post-mortem* and of the very insanitary state of the animal's living quarters. In reply to Major Facer, if I encountered a typical pustule on a dog entering a show, I should

disqualify the animal upon mere suspicion, as the examining veterinary surgeon is entitled to do. He asks also what the Distemper Council consider to be the initial symptoms of distemper. According to their report, these are first a rise of temperature and then vomition. I think that malaise and husk also occur extremely early in the disease, as a rule. Major Facer's mention of the case of chorea which recovered after huge doses of arsenic is most interesting, and in this connection it might be mentioned that in human practice greater reliance is placed upon treatment with arsenic than obtains in the veterinary profession.

Professor Gorton wishes to know what chloretone and luminal soda are. Well, he is a qualified chemist and probably knows better than I, but I can state that they are also known as chlor-butyl and barbital sodium respectively. Their chemical formulæ I do not know. Mr. Gorton deprecates the use of proprietary drugs, but if one knows their practical value from experience of their use, I think everybody is fully justified in employing that which is calculated to be in the best interests of the patient.

If I have overlooked any other question I must ask you to forgive me, as the Chairman intimates that time is now very precious owing to train departures. Once again, gentlemen, I thank you for your welcome and for your lively interest in my paper.

Anthrax.

Discussion on Dr. Whitworth's Papers.

Dr. W. H. Kauntze, in opening the discussion, congratulated Dr. Whitworth on his two valuable papers and said that he would like to suggest some points about anthrax from the two aspects with which he was acquainted.

The question of carriers seemed to him to be of great importance from the preventive point of view, and if the facts quoted by Dr. Whitworth were substantiated in field work, they would go far to explain the sporadic outbreaks of the disease. He would like to ask him whether in any outbreak in that country there was any evidence of the first victims having come recently from a district known to be infected. He was reminded by this carrier problem of what happened to native porters during the war. Many of these were recruited in districts where cerebro-spinal meningitis was endemic. To prevent the introduction of the disease into carrier camps, these porters, on arrival in Kisumu, were detained in segregation camps for three weeks. During this period, only very seldom did a case of cerebro-spinal meningitis occur. When the quarantine was over, the porters were packed into waggons, fifty to a truck, and sent on to Nairobi. On arrival there, after twenty-four hours in the train, it was common to find two or three cases per truck, and during the first two days in Nairobi probably ten per cent. of the batch of porters went down with cerebro-spinal meningitis. Somewhat similar instances could be quoted during the pandemic of influenza in 1918.

He would like to ask Dr. Whitworth whether there was any involvement of the nervous system in anthrax in animals. It did occur in humans, and he remembered seeing a case in the native hospital there which had all the symptoms of cerebro-spinal meningitis, but whose cerebro-spinal fluid proved on investigation to contain a pure culture of anthrax bacilli.

Passing to the preventive side of the question of anthrax, it was interesting to read the history of the various steps taken to protect the wool sorters of Bradford and elsewhere from anthrax, and how again and again the measures suggested did not affect their aim, until it was discovered that the anthrax spores adherent to the wool were protected from the action of antiseptics by the layer of dried blood by which they were attached to the wool. It was only then that the elaborate process outlined by Dr. Whitworth was instituted, whereby the dried blood was removed by the first washing in soapy water, and then the spores killed by the action of formaldehyde.

It was perhaps natural that he should find the most interesting parts of Dr. Whitworth's paper to be those dealing with the question of immunity and vaccine prophylaxis, and especially the section dealing with "aggressin." He had been reading up some of the recent literature on the subject, and it seemed to him that some very important facts had been discovered, and some most suggestive theories put forward. As they bore on the aggressin theory set out in the papers which were being discussed, it might be of interest to summarise them very shortly, because he should be glad to know if Dr. Whitworth really agreed or disagreed with them. Experiments had shown that injection of anthrax bacilli into the peritoneum of certain animals, notably the guinea-pig, failed to cause anthrax septicæmia if suitable precautions had been taken to avoid infection of the skin and subcutaneous tissues. If, however, the bacilli were protected from phagocytosis by enclosure in collodion sacs, etc., which were then introduced into the peritoneum, and after a suitable period broken *in situ*, septicæmia would supervene. In connection with this, Combiesco had shown that bacilli grown in whole blood or blood plasma were not phagocyted by leucocytes from normal animals, but were by those from hyperimmune animals, so that that might explain why enclosure in collodion sacs, etc., during a short sojourn in the animal's peritoneum protected bacilli from phagocytosis, as it enabled the bacilli to immunise themselves against the defences of the animal's body fluids, as these latter diffused slowly through the permeable membrane. Incidentally, it might be noted there that if bacilli were introduced under the skin of an animal at a site where leucocytosis had been artificially induced, no general immunity supervened.

Returning again to the main theory, it had also been found that the fluid from the swelling caused by the injection of anthrax virus under the skin of young rabbits—which for want of a better name and to save needless repetition he would call "œdema fluid"—gave immunity against anthrax, and the serum from those immune animals could confer passive immunity on others. Inasmuch as the effectiveness of that serum was not impaired by mixture with anthrax bacilli or spores, whereas it was rendered inert by admixture with "œdema fluid," it was believed that the "œdema fluid" contained a substance of an unknown nature the function of which it was to break down the body defences to enable the anthrax bacilli to multiply and invade the body. This substance had,

therefore, been termed an "aggressin." The immune serum resulting from the injection of "œdema fluid" into rabbits contained, therefore, "anti-aggressins." Now, Singer believed that anthrax bacilli injected into the general circulation became the prey of the cells of the reticule-endothelial system, where they multiplied and passed secondarily into the blood, and that in vaccinated and naturally-immune animals destruction of the bacilli in those cells of the reticulo-endothelial system occurred so that they could retain the anthrax bacilli for any length of time. Conceivably, that aggressin action might take place also in regard to leucocytes, hence the necessity for the protection for a time of the bacilli from phagocytosis in the peritoneum if septicæmia was to result, as aggressin production was low in the peritoneum.

It was generally agreed now that anti-vaccination by the method of Besredka was able to produce an immunity equal, if not superior, to other modes of vaccination. Wollman stated that the greatest production of anthrax aggressin took place in the skin, which suggested a reason for the efficacy of anti-vaccination. It was interesting to note that rabbit anti-aggressin serum contained precipitins not only for "œdema fluid," but also for the blood of rabbits which had died of anthrax.

That suggested dependence of anthrax bacilli on an aggressin reminded one of Gye's recently published work on tumour origin, with this difference, however, that whereas Gye had demonstrated the dependence of tumour formation on two factors, a living non-specific virus and a chemical specific substance, in anthrax they had a living specific virus allied with a chemical substance whose specificity or non-specificity had not yet been demonstrated.

He had emphasised this aggressin theory because he thought it was of importance from the point of view of treatment. Dr. Whitworth had told them that favourable results were reported from the use of an aggressin vaccine in animals. So far, there was no report of the treatment of cases of human anthrax with an anti-aggressin serum, or of any attempt to immunise workers by the use of an aggressin vaccine in trades where they were liable to contract anthrax.

Finally, he would like to ask Dr. Whitworth if he had any explanation of the apparently-relatively avirulent type of malignant pustule seen amongst natives in that country. Immunisation by continual contact with, or eating of, anthrax-infected meat would be a plausible explanation, but he believed that Europeans also showed marked resistance to malignant pustule. Furthermore, intestinal anthrax seemed to be relatively a fatal disease with natives. Coming as he had from a hospital in England, where numerous cases of malignant pustule were treated and where it was looked on as a serious disease, he could well remember his astonishment at the recovery of the first case of malignant pustule he saw in Kenya during the war. The pustule was on the shoulder, with a good deal of typical anthrax œdema on the same side of the neck. He sent the subject to the Infectious Disease Hospital, hardly expecting to see him again, and a fortnight later the native returned perfectly well without having received any treatment other than rest and food. He then made enquiries and found that it was a generally-accepted fact that cases of pustule recovered without the necessity for the use of anti-anthrax serum or surgical interference.

Mr. H. H. Brassey Edwards thanked Dr. Whitworth for his able papers and continued: the writer mentions that the importance of the subject under discussion is undoubtedly due to the increased prevalence of the disease in Kenya Colony. I wish to qualify that statement by reference to the departmental records, for which I am mostly responsible. For the present year (January—June) the number of fresh outbreaks recorded in settled European areas is as follows: June, 8; May, 6; April, 7; March, 2; February, 3; and January, 3. The districts affected are Nairobi, with sixteen outbreaks; Uasin Gishu, with 6; and Nakuru with 7. Every native reserve may be said to be infected, but to what extent it is impossible to determine, until stricter veterinary supervision is maintained and all deaths from disease are reported for verification. Anthrax is known to all native stock-owners and no report is made to the District Veterinary Officer until a disease is widespread. The numbers of outbreaks recorded were 1925, 41; 1924, 50; 1923, 27; 1922, 32; 1921, 18; 1920/19, 15; 1918/17, 25.

Anthrax must be widely prevalent in game, although it is difficult to prove, as any carcase is soon devoured by the carnivorous game. It has been brought to my notice, for two years in succession, that mobs of hartebeestes and wildebeestes have died on the plains near Nairobi. I know the pasture to be heavily infected with anthrax, as cases of the disease have been diagnosed in herds of dairy stock grazing the area. Remnants of the carcases of the dead game have proved negative to tests because of putrefactive changes.

The infection of native humans can be caused by infection of wounds when making *post-mortem* examinations on carcases. Two cases in veterinary orderlies can be recorded and in each a malignant pustule appeared on their arms with great swelling of the limb. Both orderlies recovered from the disease.

In regard to the period of incubation, it is stated that a definite period cannot be given, but in the departmental pamphlet published by the Research Laboratory, Kabete, on Anthrax, the period is given as from 1—14 days. From a Public Health point of view, I considered the matter should receive attention, with the object of obtaining more definite information, as, in accordance with the present quarantine restrictions, it is necessary to close down dairies for a period of a fortnight from the date of the last case, which seems to me to be a very long period when taking into consideration the accepted knowledge of the disease.

In the sub-acute form of the disease, a practice was adopted during an outbreak of taking temperatures of the in-contacts and the writer states "that as a method of diagnosis of anthrax in in-contacts it is of no value, on account of the unreliability of temperatures in this country." Before the present restriction of an absolute stoppage of milk was placed on all infected dairies, resort was made to taking temperatures of all in-contact animals which we were grazing over the infected pastures during the period of vaccination, and in the event of the registration of even temperatures the milk was allowed to be sold to the public from these animals. I am not aware

of any ill-effects resulting from this course, but I agree that the risk is such that temperatures may be unreliable, even if normal and a safety line is drawn with an absolute restriction.

However, we are informed that the milk contains the organism only a few hours before death, and since this secretion is entirely suppressed comparatively early in the course of the disease, there is little chance of milk being responsible for transmitting infection; therefore it would appear, in view of what I have already said, that we have a very debatable point before us.

The local conditions of suitable temperature and moisture of the climate favouring the multiplication of anthrax spores, may account for the outbreaks of anthrax, which assume in some places an enzootic form.

Quite recently, reports have been received of cattle and goats dying in large numbers, and the outbreaks were brought to the notice of the Veterinary Department, in one instance by the Medical Department, on account of an epidemic of anthrax among native humans through the flaying and eating of the carcases. An important point in this connection, *i.e.*, the multiplicity of spores, is the exportation of skins and hides from this country. There is no doubt that anthrax exists in all the native reserves of this country and disease is increasing yearly. The habit of the natives of flaying the carcases and selling or exchanging the hides is natural, although I understand there are certain native tribes who recognise the disease and refrain from eating the flesh, but invariably remove the hide or skin. As the Veterinary Department are now asked by the Hides and Skins Buyers Association to undertake the project of teaching the native to shade dry the hides and skins, it would appear to increase the risk of exporting the disease in the semi-dried hide, as we are informed by the writer "that the bacilli are destroyed in layers in the sunlight in from six hours to twenty days, according to the thickness of the layer, and, further, spores are highly resistant to most agents. Simple drying does not destroy them after long periods." It is needless for me to say what harm would be done to the trade of hides and skins in this country if an embargo was placed against the export of these products on account of the danger of handling them.

Diagnosis after death: The difficulty of demonstrating anthrax bacilli in the blood of equines after death may lead one to consider the possibility of altering one's diagnosis in the absence of a *post-mortem*. During the war, a considerable mortality was experienced among equines, and it was found that smear examination did not always reveal the cause of the disease, until sterile cotton swabs were forwarded for examination in addition to the smears, and in some cases the swabs were positive to anthrax and the smears negative. Until the definite diagnosis was established I would say that I consider the disease might be horse sickness, on account of the similar lesions occurring in the head region.

Immunisation: The use of Pasteur's vaccines, as practised in this Colony, is effective, and the immunity conferred lasts for nine months. I have one objection only to the present method and that is the size of the dose (from $\frac{1}{2}$ to $\frac{1}{4}$ c.c.) to be given to each animal, as it is a practical impossibility to inject small doses with accuracy under field conditions.

The writer has given four explanations for severe reactions, which sometimes follow vaccination, in the form of swellings. As a rule, the swellings which follow the inoculation of anthrax vaccines are small and negligible, but there are a few exceptional cases and I wish to mention one vaccination of grade dairy stock which came under my notice. I would ask the writer to assign a cause to the enormous swellings. A European dairyman, near Nairobi, asked for the vaccination of his stock against anthrax, as several deaths from this disease were reported in other herds close by. Accordingly, fifty-three high-grade Ayrshire and Shorthorn cows, heavy in milk, were vaccinated with all due precautions in accordance with instructions. On the second day after vaccination, swellings began to form over the seat of inoculation and within forty-eight hours the swellings had involved the whole of the shoulder region, and extended over the chest to the dewlap and down the fore leg as far as the knee. The swellings were of a painful nature and, in my opinion, were composed of the gelatinous œdema peculiar to anthrax. No animals died. The swellings in the mild cases subsided within ten days, whereas the more severe cases took a month. The milk yield of the cows was reduced by one-sixth of the bulk. No ill effects were noticed as the result of the swellings.

In conclusion, I would add how pleased this young Veterinary Medical Association is at seeing so many of the medical fraternity present, which is proof of keenness on a closer co-operation between the two professions in matters of joint interest.

Mr. DAUBNEY expressed his appreciation of the account given by Dr. Whitworth of the more recent laboratory work, particularly with reference to the questions of infection and immunity. It seemed that in the case of anthrax, as in the case of certain other diseases, one recent discovery had re-opened the whole field of research which one had thought was closed perhaps twenty years ago. He referred to the question of skin infection and to the possibilities of local immunisation. Dr. Whitworth had also raised the question of "carrier" animals. For many years past, anthrax had been considered such an extremely fatal disease that the question of transmission by "carrier" did not appear to enter into the problem at all. It was now known that "carriers" of anthrax could exist. Dr. Kauntze had referred to "carriers" in cerebro-spinal meningitis and to the possibility that under exposure to particularly unfavourable conditions, such as travelling by train, these "carriers" might break down as acute cases of the disease. One similar case that came readily to mind was that of paratyphoid infection of lambs. It had been recorded that for years during the annual migration from some of the more Southerly States to the Northern pastures for feed, large numbers of lambs developed acute paratyphoid infection during the trek and extremely heavy losses were incurred.

He wished to make a few remarks on the question of immunity. The practice in America was to inoculate spore vaccines and serum simultaneously, as Dr. Whitworth had informed them, and excellent results had been obtained by the use of that method. He believed, however, that he

was right in stating that when a large number of spore vaccines from various parts of the world was tested, many of them were found not to contain viable spores and it was, therefore, extremely important that the greatest care should be exercised in the manufacture of the spore vaccine. The great objection to the use of serum when vaccinating large numbers of domestic animals was its expense, and, if possible, therefore, vaccination should be carried out without the use of serum.

The application of the filtrate method of immunisation to anthrax appeared to have some basis in recent laboratory work. There were still many people who disputed the existence of an aggressin as separate from a toxin. There was no doubt, however, that the application of this method to blackleg immunisation had proved uniformly successful throughout the world. Referring to the intradermal vaccination of animals against anthrax, certain French veterinarians, notably Velu, had carried out large numbers of vaccinations with apparently complete success. The existence of local or tissue immunity seemed to be well established in certain diseases. Besredka had stated that after the skin immunisation of laboratory animals, the immunity acquired was not a blood immunity, since the serum did not protect other animals. It would be interesting to know if Besredka attempted to infect those animals on different areas of the skin or close to the site where vaccination had been carried out. He believed he was right in stating that one worker had immunised one eye to pyocyaneus infection and that the uninoculated eye remained susceptible. It had been definitely established also that immediately subsequent to the generalised eruption in foot-and-mouth disease a very definite local tissue immunity existed, and it was not possible to re-infect an animal at this time. The blood immunity, however, as evidenced by its power to protect animals against subsequent inoculation of foot-and-mouth disease, did not appear until about seven days after the development of the tissue immunity. Further, animals protected by the inoculation of immune or hyperimmune serum did not receive a local immunity, since inoculation would result in the production of a local lesion although the blood immunity prevented generalisation of the disease.

Captain MULLIGAN expressed his appreciation of the treatment of the subject by Dr. Whitworth. He thought it was a great pity, however, that Dr. Whitworth did not discuss the biological or biologico-chemical side of the spores. It was known that the bacilli themselves lived for a very limited time even when conditions, such as the soil, etc., were favourable, but the question of the period of the life of the spores was one that had not been decided. The spore lived for varying periods, from twelve months to twenty years, and he thought that a knowledge of its chemical composition and environment would have a very important bearing on its existence and nature. He considered this was a line of research which should receive special attention and it appeared to him to be an important factor in the control of the disease. With regard to the method of infection, Captain Mulligan, continuing, said that someone had mentioned that game were supposed to contract anthrax only in their natural habitats; in his opinion, the greatest scavengers were vultures. Possibly the spores passed through these birds and in that way infection might be spread.

He was not quite certain whether the symptoms seen in natives were always caused by the ingestion of infected flesh or by infection from wounds, scratches, etc., when natives were opening carcases.

THE REPLY.

In reply, Dr. WHITWORTH expressed his appreciation of the interest that had been taken in the paper.

Dr. Kauntze had asked whether there was any definite evidence of the first victims of anthrax, in an outbreak in that Colony, having recently come from a district known to be infected with the disease.

So far as he (Dr. Whitworth) was aware, no such specific case could be cited unless one considered those cases which were frequently observed in transport oxen. It seemed probable that all districts in that Colony were infected. With regard to nervous symptoms in anthrax, he had seen references to cases in human beings similar to those observed by Dr. Kauntze. In some diseases in animals, cerebral symptoms were very definite and might be predominant, while in other cases such symptoms might be indefinite owing, possibly, to the inability of some animals to demonstrate such symptoms. Apoplectic symptoms, in bovines and ovines dying of anthrax, were seen in those cases in which death occurred more or less suddenly, and in his opinion these were cerebral symptoms. In equines symptoms of great distress resembling cerebral symptoms were sometimes observed, but that was probably the result of impaired respiration as a result of the lesions which were seen in the region of the throat.

Major Brassey Edwards had referred to the method to be adopted when dealing with an outbreak of anthrax in a milking herd. He (Dr. Whitworth) had suggested that the temperature method of diagnosing anthrax in in-contact animals was unreliable in that country. He was of the opinion, however, that it was the only method of any practical value from the public health point of view when dealing with an outbreak in a dairy herd. According to M'Fadyean, it would appear probable that in every fatal case of anthrax in a milch cow the bacilli were present in the milk within the udder at the time of death. He thought it was also probable that milk invasion did not occur until the bacilli had begun to multiply in the circulating blood, and since invasion of the circulating blood took place only shortly before death—the time of invasion varying in individual cases—it was certain that no animal maintained a normal temperature after the bacilli had begun to multiply in the blood. Another point mentioned by M'Fadyean was the possibility of milk escaping into the acini and mingling with the milk accumulated in the milk cistern since the previous milking. Therefore, although milk secretion was suppressed in cows suffering from anthrax, there was a possible danger of infection from the full udder. Dr. Whitworth suggested that it should be the practice, when dealing with anthrax in a milking herd, to take the morning temperatures before milking and withhold the milk from any animal which showed an elevated temperature or, of course, visible symptoms of illness. With regard to Major Brassey Edwards' reference to diagnosis in equines, the essayist said

that the establishing of a positive diagnosis in a positive case was not always a simple matter. Knowles had demonstrated by practical experiment that the diagnosis of anthrax in equines should include cultural examination in cases where the organisms could not be demonstrated microscopically ; and in cases where the blood for examination was not obtained immediately after death, or was obtained without aseptic precautions, that the inoculation of guinea-pigs be made. Knowles had examined forty-six animals, 74 per cent. of which were positive by smear examination, and the remaining 26 per cent. were negative by smear but positive by cultural examination. Referring to the unfavourable vaccination sequelæ mentioned by Major Brassey Edwards, Dr. Whitworth said that such results were reported from time to time in all countries where potent anthrax vaccines were used. It was considered that a local reaction to anthrax vaccination was a favourable result, in that it produced some immunity, provided such reactions were not abnormally severe and caused no mortality. In the preparation of such a living vaccine as the anthrax vaccine used in that Colony, every care was taken and purity and safety tests were carried out before each lot of vaccine was issued. The fact that severe reactions were very occasionally seen in practice was, in Dr. Whitworth's opinion, a favourable result, in that it indicated that the vaccine was potent. It did not appear to him possible, as yet, to produce a potent living anthrax vaccine which yielded a good immunity with, at the same time, no local reaction in all cases. Assuming that the inoculations mentioned by Major Brassey Edwards were carried out with strict precautions as to asepsis and dosage, the speaker suggested the only explanation of the results as being some factor affecting the individual susceptibility of the inoculated animals.

Referring to the avirulent type of malignant pustule seen in natives in that Colony, Dr. Whitworth said that subacute forms of anthrax were also observed in animals in Kenya. He thought it possible that different strains of the anthrax organism existed in Kenya.

In regard to Besredka's work on cuti-vaccination, the essayist said that, so far as he was aware, Besredka had not considered the possibility of a strictly-localised skin immunity, as suggested by Mr. Daubney, and Besredka claimed that the immunity conferred by cuti-vaccination was complete, no matter by what path the subsequent virulent inoculation was made.

Dr. Kauntze and Mr. Daubney had referred to the question of aggressins. He was quite aware that there was much diversity of opinion as to the nature of the so-called aggressins. He was inclined to believe that toxins and aggressins were not identical. Some pathogenic organisms could be proved to produce so-called toxins both *in vitro* and *in vivo*, while other equally pathogenic organisms produced no such toxins. Yet, under certain conditions, those later types of organisms could be proved to produce some substance which had a certain action on phagocytosis, and, if Salsbery's experiments could be confirmed, those substances could be used as immunising agents in the case of anthrax.

Mr. Daubney had suggested that aggressins were weak toxins, but in the preparation of anti-toxic sera or filtrates only strongly toxin-producing strains of a particular organism were satisfactory. If aggressins were weak toxins, it would seem rather contradictory that they should be of any value as potent immunising agents.

Recent researches, some of which had been mentioned by Dr. Kauntze, seemed to indicate that anthrax infection and immunity were involved in the process of aggressin and anti-aggressin production.

The President and Captain Mulligan had referred to the life of the anthrax spore in the soil as being possibly the most important factor in dealing with the disease. He understood that special work in this direction was being carried out in South Africa. No doubt research in this direction would be interesting, and would probably throw some light on the biology of spore-forming organisms generally, but it appeared to him doubtful whether such research would bear fruitful practical results so far as the control of anthrax was concerned.

The extraordinary resistance of the anthrax spore was well known, and its importance in spreading infection was an accepted fact. It was recognised that the anthrax carcase must be disposed of in such a way as to prevent the dissemination of the spores of the organism, and this could be done with certainty only by the complete burning of the carcase and of the infected material with which it had come in contact.

Dinner to Major Dayer-Smith.

On the 10th December, the R.A.V.C. 47th (2nd London) Division, T.A., held a dinner at The Comedy Restaurant, in honour of Major P. Dayer-Smith, O.B.E., T.D., on the termination of his appointment as D.A.D.V.S. to the Division.

Staff-Sergeant Woollard very ably expressed the appreciation and thanks of the unit for the very efficient and courteous manner in which Major Dayer-Smith had discharged the duties of his office, and pointed out that under Major Dayer-Smith's administration the unit held the highly-creditable position of not only being one of the most efficient in the T.A., but of being, perhaps, the only one up to establishment, having a total strength of 105, all ranks, while, in addition, it has a waiting list of candidates. Staff-Sergeant Woollard was pleased to inform the members that the happy family of the R.A.V.C. were not going to lose their leading member, as he had consented to remain with them in command of the Mobile Veterinary Section.

Major Dayer-Smith, in his reply, heartily thanked the members of the unit for their appreciation of him in giving a most excellent dinner with the cheeriest company. He was pleased to say that he was not going to leave the unit, but was only taking an "Irishman's Rise." Major Dayer-Smith said it was an easy thing to obtain good results when one was blessed with such an excellent permanent staff as had been his during his term of office. He wished to thank the officers, warrant officers, N.C.O's. and men for their hearty support and assistance and the good fellowship which had led to the development and efficiency of their unit.

Captain W. Hamilton W. Kirk presided at the piano and led the talent that is always to be found in the R.A.V.C. in providing most excellent entertainment.

The following were present :—Major P. W. Dayer-Smith, O.B.E., T.D., R.A.V.C. (T.A.), Major R. F. Wall, T.D., R.A.V.C. (T.A.), Captain W. H. Kirk, R.A.V.C. (T.A.), Captain W. H. Anderson, R.A.V.C. (T.A.), Captain D. R. Chalmers, R.A.V.C. (T.A.), Lieut. F. J. Eardley, R.A.V.C., (T.A.), R.S.M. M. J. Corr, R.A.V.C., Staff-Sergeant P. Dalton, R.A.V.C., A./R.S.M. D. Moss, R.A.V.C., Staff-Sergeant A. J. Woollard, R.A.V.C. (T.A.), Staff-Sergeant J. F. Smith, R.A.V.C. (T.A.), Sergeant J. H. Riley, R.A.V.C. (T.A.), Sergeant H. Wickling, R.A.V.C. (T.A.), Sergeant F. J. Cole, R.A.V.C. (T.A.), Sergeant G. D. W. Thomas, R.A.V.C. (S.R.), and Private A. C. Wright, R.A.V.C. (T.A.).

The Veterinary Record.

25th December, 1926.

TO-DAY.

For the first time since the *Veterinary Record* became a "National" possession its issue bears the date of Christmas Day. Probably, moreover, many of you who read are doing so in that comfortable, semi-somnolent hour which follows the dealing out of a full measure of justice to The Dinner of The Year and, with a half-apologetic "Let's see what the *Record* says," have seized this opportunity of rescue from an undignified lapse into slumber.

To-day, however, you shall not escape thus easily from the all-embracing Christmas atmosphere: wholeheartedly we aid and abet the ceaseless endeavours of the younger members of your family to make the excitements and delights of Christmas morning last the livelong day. For you must remember that the *Record* offices adorn the very heart of Dickens-land, with Doughty Street round the corner and *The* Old Curiosity Shop almost within a stone's throw.

It is not to be wondered at, therefore, that in such an environment, which would impose an obligation upon the Editor of a *Gravediggers' Gazette* to pay tribute to the spirit of Christmas, we call a halt in the 52-week march of columns of staid professional material and insert a salutation to our readers in the spirit of the man who put the "merry" into to-day's universal wish.

We leave it to the President's appropriate pen to "Greet the unseen with a cheer" next week. Christmas Day is a self-contained festival—let us enjoy it without unprofitable reflection on the shortcomings of the closing year, or toilsome thought for the morrow in the making of resolutions whose portion of life will be of the briefest.

Somewhere, at least, where the *Record* is read, snow is driving seasonably before the bitter wind and lights are showing early through the forbidding dusk. Barricade yourselves, then, in your holly-decked homes, pile high your Yule-log fires, and let Heaven help your cases on a night like this.

"God bless you, merry Gentlemen!"

The Editor would be glad if the contributor who signs his article "Effendi" would communicate with the office.

Royal College of Veterinary Surgeons.

EXAMINATIONS—DECEMBER, 1926.

LIST OF SUCCESSFUL CANDIDATES.

DUBLIN.

Class A.
Thompson, A.

Class B.
Flynn, P. T.
Lowndes, J.
*McGeady, P.

Class C.
Downes, C. P.
Johnston, T. E.
Linton, J. J. K.
Magnier, C. F.
*Peatt, J. N.

Class D.
Langley, H. R.
McNally, J. P.
O'Connor, M.

GLASGOW.

Class A.
*Kent, R. K.
McPherson, D.
Pollock, J. F.

Class B.
Baird, M.

Class C.
Thomson, A.

Class D.
Clark, E.
Hunter, A.
Macdonald, H.
Morris, H. V.
Robb, A. H. F.

EDINBURGH.

Class A.
Burt, W. J. F.
Morris, J. A.
Oliver, G. M. G.

Class B.
Blair, J. S.
Brown, R. H.
Dawe, E. C. S.
†Davidson, C. B.
*Grasovsky, Y. S.
Irwin, T. H.
McLauchlan, J. D.
Orr, W.
Priestley, F. W.
Strachan, C. G.

Class C.
Findlay, J. H.
Macpherson, D. A.
Michie, N. G.
Reid, J.
Ritchie, J.
*Souter, J. G.

Class D.
Ackroyd, E.
Cameron, J.
Fotheringham, W.
Gray, W. S.
Hamilton, A. P.
Hendry, S. P.
Hodgson, J. F.
Macphee, D. A.
Mitra, A. K.
Sim, M. J.

LIVERPOOL.

Class A.
Davies, D. E.

Class B.
Marginson, G. C.

Class C.
Davies, B. E.
Gilmore, A. E.
Prescott, E. W.
Shedlock, Miss K. W.

Class D.
Fraser, A. C.
Salt, J. G.
Storrar, E. R. D.

† denotes 1st Class Honours.
* denotes 2nd Class Honours.

LONDON.

Class A.
Francis, F.
*Norrington, C. P.
Law, R. H.

Class B.
Balfour-Jones, S. E. B.
Cartland, B. S. T.
Catmur, B. G.
Hole, N. H.
James, A. J.
Messervy, A.
Singh, H.
*Thomas, A. L.
Thomas, D. H.

Class C.
De Garis, J.A.
Ede, P. J.
Goodall, L. M.
*Hale, D. M.

Class C—contd.
Hedley, J. F.
Hodgman, S. F. J.
Holman, H. H.
Langley, E.
*Mills, G. H.
*Prime, R. T. C.
Thompson, P. G. M.
Webb, E. A.
Xuto, C. S.

Class D.
Bruford, J. W.
Chamberlain, T. G.
Coulthard, R.
Handa, B. N.
Pembrey, C. W.
Shaw, J. K.
Stephens, E. H.
Wood, J. H.

* denotes 2nd Class Honours.

CLINICAL AND CASE REPORTS.

An Unusual Case.

By G. N. GOULD, Jun., M.R.C.V.S., Southampton.

I received an urgent 'phone call recently to attend a cow that appeared to the owner to have "gone mad."

On my arrival I learnt from him that he had purchased the cow—a month or six weeks after its third calving—over three months previously. and that it had had recurrent attacks of diarrhœa which had become progressively worse and of longer duration ever since he had bought it. The cow had had one of these attacks during the six days previous to this particular afternoon and he had been giving it some astringent medicine. The cow was a very good milker—averaging five gallons—and was in good condition. It had eaten well up to two days previously.

He had found it very difficult to drench that morning, the animal having refused to open its jaws to any extent and during his attempts the cow became very excited, swung its head round, and knocked him down. He then noticed it was standing very wide on both the fore and hind legs and that the tail was somewhat erect. During the next hour it became wildly excited, especially if anyone approached it, and began to swing its head against the partitions of the byre.

On opening the door of the byre, I found the cow to be in the further end stall, straddled back and front, tail slightly elevated and quivering, the muscles of the quarters and shoulders tense. The cow appeared to be propped up on its legs and was beating its head from side to side, but immediately I approached it brought its head round towards me, plunging on its neck chain. It had an intensely wild look and was salivating profusely.

I informed the owner that the animal was, in my opinion, suffering from tetanus, and advised immediate slaughter. This was carried out. After enquiry, I found no evidence in the cowman's knowledge, of any wound or abrasion, sore feet, etc., and on being asked the origin of the infection, I gave the opinion that, taking into consideration the history of the case, the infection had probably arisen from a wound in the stomach caused by a piece of wire or other such object which the cow had swallowed at some time.

A *post-mortem* examination, at which the owner was present, was made, with the following result. The reticulum was adherent to the diaphragm over a patch three times the size of the palm of the hand. The adhesion was easily broken down and, on examination, there was no evidence of any penetration of the diaphragm.

During dissection of the loose, hæmorrhagic, jelly-like adhesive material from the wall of the reticulum, a piece of metal—galvanised—was found penetrating the wall of the stomach at two points about one and a half inches apart. I cut away a porton of the wall of the reticulum and found the metallic object to be a galvanised staple with the two free ends directed *into the reticulum penetrating the wall in an oblique direction.* The lesion was confined to the wall of the reticulum and surface of the diaphragm, there being no evidence of penetration of the diaphragm or of pericarditis.

It appears obvious that the staple must have made at least one circuit through its length of the thickness of the abdominal wall and it seemed favourably placed for a second. From the extent of the adhesion and the hæmorrhagic nature of the lesion, I am of the opinion that possibly a number of small circuits had been made—possibly corresponding with the attacks of diarrhœa—four in number. As far as enquiries revealed, the animal could not have picked up the staple on the particular farm, so that it appears certain that it was in the cow's stomach when it was bought three months previously. The staple was quite bright when removed.

The owner has kept the staple as a memento of an unfortunate loss.

Odd Notes.

By G. B. PURVIS, F.R.C.V.S.

1. I have to record the finding of *Trichostrongylus extenuatus* (Raillet, 1898), Ransom, 1907, in the American bison. This animal had been about two years in the Edinburgh Zoological Gardens, where I collected the material. The parasites were apparently the cause of the death of the animal.

Ransom (*Nematodes parasitic in the Alimentary Tract of Cattle, Sheep and other Ruminants*) does not record this host.

(Continued at foot of first column next page.)

REPORT.

The Sixteenth Report of the Development Commissioners, for the year ended 31st March, 1926.

In reviewing the previous year's report, comparison was made of expenditure in respect to animal husbandry with that allocated for crop production, and furthermore the grants for animal husbandry were sub-divided into (*a*) those applied for animal nutrition, breeding and dairying, or what might be termed the health side of animal husbandry, and (*b*) those directed towards animal disease. The same procedure has been followed in this review.

It will be remembered that the money at the disposal of the Development Commissioners falls under two headings, *viz.*:—(1) The "Old" or Ordinary Fund set up by the Development and Roads Improvements Acts of 1909 and 1910 for the development of agriculture, rural economy, and fisheries, and to which a sum of approximately £200,000 is voted annually; and (2) The "New" or Special Fund provided by Section 3 of the Corn Production Acts (Repeal) Act, 1921, amounting then to £850,000 for England and Wales (separate allotment of £150,000 for Scotland), and standing at £537,481 on the 1st April, 1925. After payments during the financial year 1925-26 of £268,930 from the Ordinary Fund and £216,386 from the Special Fund, the balance of the two Funds on the 31st March, 1926 remained at £147,679 and £367,780 respectively. The latter Fund was expressly provided for promoting agricultural development, including the establishment of scholarships for the sons and daughters of agricultural workmen and others, and it was calculated to last until March, 1927.

In the accompanying Table, on pages 1152 and 1153, endeavour has been made to show expenditure in detail under the before-mentioned major headings, and though this may be taken as approximately or reasonably correct, there are certain items the expenditure of which is chargeable to two or more of the sub-divisions. For instance, the grants to the Institute of Agricultural Parasitology, though entered under the heading of Diseases of Animals, relates to both animal and plant parasitology. It is difficult also from a short text to make anything but an approximate proportionate estimate of expenditure in the Advisory and Local Investigation Service under the various sub-headings, for the agricultural chemist may be required to investigate animal products and, generally speaking, advisory service suggests expert team work in all phases of agricultural industry. However, a study of the table as it stands, and a comparison with that made out last year, shows that the expenditure on account of Agriculture and Horticulture (*i.e.*, crops, soils, manures, &c.) has increased by £45,000, that expenditure on account of animal nutrition, breeding and dairying has increased by roughly £48,800, and that expenditure on account of animal diseases shows a reduction of £20,800. It is feared that in the Veterinary Profession this will be universally regretted, for it requires all the support it can command in the furtherance of Veterinary Preventive Medicine, which counts for so much in the progress and prosperity of the Agricultural Industry, and which has so strong an association with Public Health. It is, perhaps, outside the province of this review to criticise or even make comment on disbursements which have received careful individual consideration, but where national interests are concerned one feels justified in suggesting that Veterinary Education and Research should be enabled, indeed should be forced, to keep pace with other activities with which they are allied or associated.

Commenting on matters purely veterinary, it is satisfactory to note the progress and the increasing volume of the work at the new Research Institutes of Animal Pathology. At Cambridge, with a Director, two principal assistants, two senior assistants, and three junior assistants, and with a grant of £9,750 for the year, special attention has been directed to sheep diseases associated with lambing. Working with a motor laboratory, lamb dysentery in Northumberland was investigated, but without definite conclusions as to cause. Investigations into several serious outbreaks of abortion in ewes were carried out, the causal organism determined, and an immunising vaccine prepared. Two distinct forms of joint-ill in lambs have been described. Investigations into white scour in lambs in certain Southern Counties were undertaken, and results may possibly establish a relationship with the lamb dysentery of Northumberland. Work in connection with garget in ewes, and blood sores in sheep has also been carried out. In the laboratory, helminthological questions have been made the subject of systematic study. As already well known, Professor Buxton has developed the technique of the Double Intradermal Tuberculin Test, and it is now being extensively employed by veterinary practitioners. Associated with the test was a potency test for tuberculin, details of which have also been published. The

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(*Continued from previous page.*)

2. Lymph caseo-adenitis of the sheep in Kenya Colony. This has not previously been recorded from this region. I saw one case in a sheep, dead from other causes, in Kenya, in 1923. As no facilities existed at my station for the making of cultures, none was made. Smears sent to the laboratory were reported on as "containing a bacillus morphologically indistinguishable from *Bac. Preisz-Nocard* — and only that." In view of the distinct clinical characters of this disease, I suggest that the above can be taken as provisionally indicating the presence of the disease in Kenya Colony.

3. Demodectic mange of cattle and goats occurs in Kenya Colony. The diagnosis in the case of cattle was made by the laboratory and in the latter case by myself. My material, preserved for further study, was unfortunately destroyed by mould.

demand for vaccines, tuberculin, serum, &c. during the year was considerable, and is increasing.

At the Research Institute of Animal Pathology, Royal Veterinary College, under Sir John M'Fadyean, with one Principal Assistant and three other assistants, researches were chiefly in connection with contagious abortion in mares, Johnë's disease, and quarter-evil. Enquiry into equine abortion seems to justify the conclusion that it is a comparatively rare disease in this country, excepting in thoroughbreds. In experimental treatment of Johnë's disease no cure was effected. Avian tuberculin—for diagnostic test in herds—was supplied by the Institute. Investigations regarding quarter-ill were mainly directed towards differential diagnosis and vaccination, a supply of vaccine being made available *gratis*.

With a Director and two research assistants, the work of the Scottish Animal Diseases Research Association seems extraordinarily heavy, and the annual grant of £2,300 small in comparison. The new Institute at Liberton is to function from the summer of 1926, a portion of the Royal (Dick) Veterinary College to form an annexe to the Institute. As stated last year, work has chiefly been associated with sheep diseases, notably braxy, lamb dysentery, trembling, scrapie, swing back, mammitis, and parasitic infestations. Grass disease in horses in the East of Scotland came under investigation, and the work of the laboratory in connection with it is being written up for publication. Braxy vaccine was prepared on a large scale during the year. Trial is also being given to the vaccination of calves against tuberculosis by Calmette and Guerin's live attenuated vaccine. Investigations conducted at the Institute of Agricultural Parasitology (Grant £5,000), concern primarily "entozoal parasites associated with, or producing disease in animals," but worm attacks of plants are also included. A Director, one principal assistant, one senior assistant, and one junior assistant are maintained. The main purpose of the Institute, relating as it does to animal disease, would appear to the reviewer to point that the appointment of director would be more appropriately and correctly filled by a veterinary expert in helminthology.

Of the Grant of £15,000 in 1925—26 on account of the investigation of foot-and-mouth disease, £9,521 was expended. Work was carried out at Pirbright Experimental Station. At least two strains of virus have been demonstrated. A good deal of work on immunity has been done in guinea-pigs and results are to be tested in cattle. The viability of the virus in carcases imported from the Continent and its probable connection with outbreaks of the disease in this country is being closely studied.

The grant to Advisory and Local Investigation Service shows an increase of, roughly, £10,000 over the previous year's grant. This is explained by additional provision at eight centres for soil survey work, the extension of dairy bacteriological work and the appointments of an extra advisory chemist and an economist. A great deal of research is now being conducted by advisory service, especially in soil survey, mycological and entomological work. So far as Veterinary Advisory Service was concerned, the Veterinary Advisory Officer at the University College of North Wales, Bangor, was mainly occupied with liver rot in sheep prevailing in the district. Lamb dysentery, braxy and worm infestation largely engaged the attention of the adviser at the Armstrong College, Newcastle-on-Tyne. At the University College of South Wales, Cardiff, investigations by the Veterinary Adviser related to avian tuberculosis, gapes and tape worms in poultry and sheep diseases. Flock owners generally appear to have been favourably influenced with regard to the efficacy of braxy vaccine. Under dairy farming, report is made of serious outbreaks of contagious mammitis in the South-West of Scotland and the indispensable use of an autogenous vaccine in eradication.

In perusing the full text of the report, review of which has been made chiefly in respect to the veterinary aspect of it, one cannot but be struck with the multiplicity of the activities covered by grants, and appreciate the great work which the Development Commissioners have undertaken to help in solving the many agricultural problems which are before the country to-day. Review also would be incomplete without acknowledgment of praise and thanks to those charged with the editing of the report and presenting it to the public in such concise form. Copies are obtainable from His Majesty's Stationery Offices at Adastral House, Kingsway, W.C.2; York Street, Manchester; 1 St. Andrew's Crescent, Cardiff; 120 George Street, Edinburgh; 15 Donegall Square, Belfast. Price 3s. nett.

J. M.

Synthetic Production of Thyroid Extract.

The Medical Correspondent of the *Morning Post*, writing therein recently, said:—

"British Physiology has once again triumphed.

"As announced some months ago in the *Morning Post*, Dr. C. R. Harington, of University College Hospital, devised a method of preparing the essential principle of the thyroid gland much more economically than had previously been possible.

"Last week he announced to the Bio-chemical Society that, working in conjunction with Professor George Barger, of Edinburgh, he had succeeded in synthesising the substance from coal tar products and iodine, and thus in artificially producing a substance indistinguishable from the active extract known as thyroxin and capable of producing the same effects on human subjects. He has also determined exactly the chemical composition of the substance in question.

"Until recently, three tons of thyroid gland were required to produce one ounce of the extract.

"Details are not yet available and it is not yet known whether the discoveries will follow the procedure adopted by Banting and his colleagues when they patented insulin. The extract is of vital necessity to those suffering from thyroid deficiency, but over-dosage might produce fatal results. From the bio-chemical standpoint it is of especial interest as furnishing a further instance of the success of the bio-chemist in reproducing a substance hitherto only known as the complex product of a highly-organised animal gland."

Grants by the Development Commissioners

AGRICULTURE AND HORTICULTURE.
(Crops, Soils, Manures, &c.)

	£
Rothamstead Experimental Station	26,200
University of Aberdeen, College of Agriculture	1,200
Research Institute Plant Physiology I.C.S. ...	6,100
Plant Breeding Institute, Cambridge University	4,960
Welsh Plant Breeding Station, Aberystwyth ...	7,200
Ditto, Capital Grant	1,800
Scottish Society Research Plant Breeding ...	1,100
Ditto, Ditto, 1926—27	1,100
National Institute of Agricultural Botany ...	3,692
Ditto, Ditto, 1926—27	4,120
Ditto, Ditto, Capital Grant ...	650
Long Ashton Fruit Research Station ...	12,600
Ditto Ditto, Capital Grant ...	1,000
Horticultural Research Station, E. Malling	7,400
Experimental and Research Station, Cheshunt	3,000
Ditto, Ditto, Capital Grant ...	300
Horticultural Research Station, Cambridge University	1,850
Silver Leaf Investigation Station, Cambridge	1,550
Agricultural Economics Research Institute, Oxford University	9,040
Institute of Agricultural Engineering, Oxford University	12,000
Advisory Service (approx.)	41,900
Special Research Grants ($\frac{13}{18}$ of £2,720) ...	1,814
Research Scholarships (5)	5,537
Scholarships for Agricultural Teachers (3) ...	
Travelling Fellowships	
Scholarships for Agricultural Workers ...	25,000
Ditto, Ditto, 1926—27	23,000
Centre for Agricultural Education in Derbyshire	3,000
Studley College for Women	1,000
Farm Institute, Plumpton	7,575
New System of Farm Management	3,000
Variety Test of Farm Crops	3,970
Ditto, Ditto, additional	210
Marketing Agricultural Produce	3,000
Ditto, Ditto, 1926—27	6,650
Testing Agricultural Machinery	1,108
Ditto, Ditto, 1926—27	1,307
Lactose Factory, Haslington	1,887
Development of Flax Industry	22,000
Young Farmers' Clubs	800
Chipping Campden Sub-Station	4,000
Royal Agricultural College, Cirencester ...	2,000
Fruit-Testing Station, Wisley, 1926—27 ...	895
Waltham Cross Experimental Research ...	300
Field Trial Jerusalem Artichokes	200
Norfolk Agricultural Station	800
Long Ashton Fruit Station (Colleges) ...	1,050
Harper Adams Agricultural College	352
Economics Officer, Scotland, 1926—27 ...	900
Costings Officers Scottish Agricultural Colleges, 1926—27	1,950
Scotch Colleges of Agriculture—Advisory Officers	6,115
Special Researches Agricultural Science, Scotland	1,421
Glasgow College of Agriculture—Soil Survey, 1926—27	655
Travelling Fellowships, Scotland	395
	£280,653

ANIMAL

Animal Nutrition, Breeding, Dairying.

	£
Animal Breeding Research Department, Edinburgh University	2,990
Ditto, Ditto, 1926—27 ...	1,733
Animal Nutrition Institute, Cambridge, University	13,150
Ditto, Ditto, extra Grant ...	100
Rowett Research Institute, Aberdeen University, Stock Farm	21,100
Ditto, Maintenance, 1926—27 ...	7,500
National Institute for Research in Dairying ...	12,000
Ditto, Endowment Fund	3,253
National Poultry Institute :—	
S.E. Agricultural College	1,055
Harper Adams College	8,526
Ditto, Maintenance (2 years)	4,292
School of Agriculture, Reaseheath ...	875
Midland Agriculture and Dairy College (Capital Grant)	26,500
Improvement of Live Stock...	19,775
Co-op. Bacon Factory Industry	250
British Goat Society, 1926—27	525
Experimental Pig Industry, Harper Adams College and Agricultural College, Wye ...	720
Dairy Bacteriology, Harper Adams College	335
National Diploma of Poultry Husbandry ...	25
Scottish Milk Records Association	3,502
Ditto, 1926—27	3,540
Advisory Service (approx.)	9,500
Special Research Grants, $\frac{3}{18}$ of £2,720 ...	302
Research Scholarships (1)	1,277
Scholarships for Agricultural Teachers (2)...	
Dairy Bact., Armstrong College	325
Ditto, Advisory Centres	1,775
	£144,925

for the year ended 31st March, 1926.

HUSBANDRY.

Diseases of Animals.

	£
National Poultry Institute:—	
Veterinary Laboratory Weybridge (2 years)	1,831
Institute Animal Pathology, Cambridge University	9,750
Research Institute in Animal Pathology, Royal Veterinary College	5,000
Scottish Animal Diseases Research Assoc.	2,300
Ditto, 1927—27	2,300
Institute of Agricultural Parasitology, London	5,000
Ditto, Capital Grant	5,650
Ditto, Additional Grants	950
Research, Foot-and-Mouth Disease ...	15,000
Liverpool University Veterinary School ...	1,430
Advisory Service (approx.)	2,500
Special Research Grants $\frac{4}{5}$s of £2,720 ...	604
Research Scholarships, &c. (1)	426
	£52,741

RURAL ECONOMY.

	£
Rural Industries Bureau	3,953
Kent Craftsmen Co-op. Society	500
National Federation of Women's Institutes ...	950
Ditto, Handicraft Work, 1926—27 ...	1,840
Scottish Women's Rural Institutes (2 years) ...	1,000
Scottish Agricultural Organisation Society ...	1,000
Scottish Rural Industries Survey	113
Fabric Photos Ltd.	171
	£9,527

ABSTRACTS.

The Resistance of Fowl to Strychnine.

The experiences here reported indicate that chickens and pigeons possess a relative immunity to strychnine only when the drug is given by the mouth. The minimum lethal dose was found to depend on the contents of the crop, the rate of absorption being inversely proportionate to the amount of food in the crop and directly proportionate to its fluidity. Glucose, presumably by increasing the glycogen content of the liver, enables the animal to withstand a larger dose. While this is not understood, it is thought that it may be due directly to the glycogen or to its elaboration of a neutralizing agent.

[W. J. R. Hemkamp (*Ind. Lab. and Clin. Med.* 11 (1925), No. 3, pp. 209—214). June, 1926].

Exp. Station Record. G.W.D.

A Study of Colostrum, with Special Reference to the Effect of Heat (Pasteurisation) on its Physical, Chemical, Bacteriological, Immunological and Nutritional Changes.

The authors first consider the normal mortality and well-being of calves. Of 236 calves allowed to nurse the mothers, 6·77 per cent. died within the first six months from various causes. Of those surviving (220 calves) 1·36 per cent. died between the ages of six months to one year. Of 868 calves that were allowed to nurse the mothers for the first three or four days and were then hand-fed with the mixed whole milk of the herd, 5·57 per cent. died within the first six months from various causes. The percentage of deaths among 187 calves was 6·41 under six months of age, and 0·57 between the ages of six months to one year.

Of forty calves known not to have nursed their dams, which were fed their mother's colostrum after pasteurisation in a water bath at 140°F. for thirty minutes, 7·5 per cent. died. Ten additional calves were fed on egg-white-in-milk emulsion as a substitute for colostrum, making twenty-nine in this experiment, and there was a mortality of 34·14 per cent. Of twenty-eight calves, including seven added during the year, which were known not to have nursed their dams and which were fed on the mixed whole milk (colostrum-free), 46·4 per cent. died. The mortality rate of the non-colostrum calves appears to have depended upon the virulence of the *bacillus coli* present in the herd, and environment.

Analyses for determining the bactericidal titre of blood serum were made of twenty-four calves, the blood samples being obtained at birth, and at twelve, and twenty-four hour intervals for the first five days of life. The calves were divided into four groups, ten calves receiving milk containing several c.c. of anticoli bacteriophage filtrate, five receiving colostrum, five receiving an emulsion of egg-white-in-milk, and four receiving raw whole milk (colostrum-free). It was found that the bactericidal titre of the blood serum at birth was low, with a rapid rise with age, which appeared to be independent of the food or the time of feeding.

The blood serum of five calves exhibited the bacteriophage phenomenon after receiving colostrum. The bacteriophage was polyvalent, having a virulence against both a stock strain of *B. coli* and a virulent strain of *B. coli* isolated from a calf fed milk and which died of *B. coli* infection. The blood serum of this same growth in five calves did not exhibit a bacteriophage phenomenon before ingesting colostrum. Four calves fed milk as a substitute for colostrum failed to exhibit the bacteriophage phenomenon, and all died of *B. coli* infection.

It was found that fresh, raw colostrum has a bactericidal action against both an avirulent and a virulent strain of *B. coli*. Samples inoculated with less than 5,000 *B. coli* per c.c. failed to show the presence of this organism after eight hours' incubation at 37°C. An emulsion of egg-white-in-milk at a concentration above 20 per cent. was inhibitory to the growth of an avirulent strain of *B. coli*. Raw milk has a low bactericidal action against the growth of *B. coli*. The lytic action of anticoli bacteriophage was very low in milk. An emulsion of egg-white-in-milk favoured the lysis of *B. coli* by the bacteriophage. The optimum concentration of the egg-white-emulsion in milk appears to be between 30 and 40 per cent.

[A. C. Ragsdale, S. Brody and C. W. Weber (*Missouri Sta. Bull.* 236 (1926), pp. 46, 47). June, 1926].

Exp. Station Record. G.W.D.

D.V.S.M. Examination.

At an examination held for the Diploma in Veterinary State Medicine at Edinburgh on December 11th, the following candidate was successful:

William Donald Macrae.

First Woman B.V.Sc.

The Degree of Bachelor of Veterinary Science has been conferred upon Miss Edith Gertrude Knight, of Bruton, Somerset, at Liverpool University. This University is the only British University which grants this degree, and Miss Knight is the first woman in the country on whom it has been conferred. Seven years ago Miss Knight took a diploma in agriculture at Reading University. After working on a farm at Wycombe, Bucks, she entered Liverpool University and qualified two years ago as M.R.C.V.S.

DIVISIONAL REPORT.

Southern Counties Division.*

Meeting at Bournemouth.

A meeting of the Southern Counties Division was held on Thursday, September 30th, at the Gervis Hall, Bournemouth, when the members and visitors had the privilege and pleasure of listening to an extremely interesting paper by Captain Hamilton Kirk, on "Some Aspects of Distemper." In the absence, owing to illness, of the President, Major Wood, of Parkstone, Major E. S. Martin, of Christchurch, took the Chair, and others who signed the attendance book included Colonel F. H. Carrell (visitor), and Messrs. E. Whitley Baker (Wimborne), W. Caudwell (Bournemouth), H. Edie (Southampton), John Facer (Southampton), B. Gorton (Southbourne), R. E. Klyne (Bournemouth), A. J. Moffatt (Newport, I. of W.), C. Pack (Lymington), W. S. Petty (Southsea), George Parr (Bournemouth), R. Porteous (Portsmouth), H. C. Rockett (Salisbury), and J. H. Ripley (Hythe).

In opening the proceedings, Major Martin said he was sure they would all regret to learn that their President, Major Wood, was unable to be with them owing to illness and he suggested that their Hon. Secretary (Mr. Facer) might write him a letter of sympathy and express the hope that he would soon be about again.

The meeting concurred.

Continuing, the Chairman said he also wished to extend a cordial welcome to their visitors, and especially to Captain Hamilton Kirk, Mr. Gorton, of Southbourne, and Colonel Carrell, of Bournemouth. The latter was a member of the Kennel Club and was very much interested in the subject they were to discuss that afternoon.

The *minutes* of the last meeting, as published in the *Veterinary Record*, were taken as read and were confirmed, the Chairman mentioning that there was one little omission to be rectified, the name of Colonel Baldrey having been omitted from the list of those present on that occasion.

The receipt of letters of apology at inability to be present was announced from the President (Major Wood), Miss Cust, Major Hobday, Professor Buxton, Mr. Bullen (Godalming), Colonel Simpson (Maidenhead), and Mr. J. W. McIntosh (London). Mr. McIntosh, in his letter, also tendered his resignation, stating that he felt that the time had come when he would have to withdraw from many of his former activities and, as he was unable to attend the meetings of the Southern Counties Division, he asked that his resignation might be accepted at the end of the present financial year.

Major Martin said he was sure they were all very sorry to receive that letter from Mr. McIntosh. He was a valued member of their profession and had done good work for their Society, both as an ordinary member and as a former President, and he thought perhaps the greatest compliment they could pay him would be to elect him a honorary member.

Captain Rockett seconded and this was unanimously agreed.

Nomination of New Members was next invited and Mr. Gorton, of Southbourne, was nominated on the proposition of Mr. Caudwell, seconded by Captain Rockett.

Presidential Address.

Although unable to attend the meeting, the President, Major Wood had prepared a short presidential address and this was read to the meeting by the Chairman. After welcoming the members to Bournemouth and thanking them for the honour they had done in electing him as President for the current year, the President, in his address, proceeded: "It is usual, I believe, for your President to give what is termed an address to the Fellows of the Society, and I would ask your forgiveness for the many shortcomings in this contribution of mine. The Society has had a long and honourable career, and their last annual meeting, held at Red Lion Square in March, was their 42nd. The work of the past year has been interesting and, I think, beneficial to us in our daily practice. The meeting held at Major Martin's house was of particular value and most enjoyable. The paper read by Professor Buxton was on 'The Intradermal Test for Tuberculosis in Cattle,' and this was followed by a practical demonstration, so that all who were present should have been able to apply the test with more confidence than might otherwise have been the case. At our last annual meeting we had another interesting paper by Dr. Stanley White, on 'The Application of Gland Therapy to Veterinary Practice,' and, as this was rather too big a subject to be compressed into the one hour at the Lecturer's disposal, I, for one, should like to hear Dr. White again, as gland therapy has, I am sure, a great future. Unfortunately, neither of these papers led to much discussion, the reason, I suppose, being that we knew very little about the subjects and also that we, as a Society, are rather apt to be tongue-tied when it comes to entering into a discussion.

"This afternoon we are to have the pleasure of listening to Captain Hamilton Kirk, on 'Distemper,' and I am sure we must all feel grateful to him for coming down from Town to talk to us on a subject which is of such importance and to which he has devoted so much time and study.

"Our Society, as you know, owes a great debt of gratitude to its honorary Secretary, Major Facer, for the hard work he has put in on its behalf, and it is up to us, I think, to do our best to second his efforts by attending the meetings and better still, bringing forward subjects of interest, such as pathological specimens or papers for reading and discussion.

"And, now, gentlemen, a few words about our profession generally and its future. Our profession is in a transition stage, and it is always the unexpected that happens. In the days that are gone we were in a state of satisfied ignorance, in that we were not aware of our ignorance. Old theories were regarded

* Received on November 2nd.

as correct and unassailable, and hard and fast methods of treatment were laid down which we learnt parrot-like and regarded as the *alpha* and *omega* of our art. In a way, they sufficed. We carried through by sheer faith in our teachers and in ourselves, and it is wonderful what can be accomplished by faith. Now that we have a truer knowledge of disease gained by patient investigation and study, we have in a measure lost our faith, for we do indeed know the depth of our ignorance. We also know that, low as we stand on the ladder of knowledge, it is possible for us, as a profession, to climb it, and that each and all of us may do something to add another rung to that ladder. The study of medicine is more interesting and absorbing than any jig-saw or cross-word puzzle, and a thousand times more useful, but it resembles a puzzle in that one piece of knowledge gained makes the road clear for more. The public now are also great students of medicine. The practitioner on his round gets many questions asked him, and many are put with the express purpose of testing his knowledge. It is different from the old days, when we had chiefly to deal with the groom and the stockman, and it is well that this is so, for to remain abreast of the stream of knowledge we have to keep our brains well stocked. It was, in most cases, the horse and our love for it that drew us into the veterinary ranks. In my day, the horse was studied almost to the exclusion of all other animals and the original veterinary craft was built up around it. Much of the treatment was brutal; firing, blistering and the neglect of anæsthetics will always remain as my recollection of veterinary teaching. Yet, on the whole, equine medicine was well ahead of the other branches of our study.

"But equine methods did not really fit our other patients, and the decline of the horse has left the field open for a deeper study of the other domesticated animals, to the general advantage of the science. Cattle pathology, which for years seemed to stand still, is now making enormous strides. It is a branch which requires years of study, both in the field and in the laboratory, and we may, I think, confidently look for great developments in the near future. Foot-and-mouth disease and the spread of swine fever are still unsolved problems, but not unsolvable. Milk fever, in which the treatment is ahead of the knowledge of its cause, is likely to be elucidated, if it is not already made clear by the work of Maguire and others. In clearing up one disease, light is often thrown on another. The smaller animals, particularly dogs and cats, seem to answer best to treatment on the lines of human medicine, and to anyone wishing to take up this work I would recommend a close study of medical works. I do not mean that medical practice alone will carry you through, but rather a judicious blending of the two methods, human and veterinary. There is an old saying that it is the hope of reward that sweetens labour, or something like that. Do we get that reward? I do not mean merely monetary reward. Do we get the positions to which we are entitled—professional and social; Inspectorships, adequate salaries, etc., or are we being shouldered out of them by others who, though less qualified, are more pushing? It may be so, but the best we can do is to make our foundations sure, perfect ourselves in every way, and, when any of us do get preferment, show the world that veterinary surgeons are the best fitted to fill veterinary positions.

"Lastly, I would urge loyalty to your fellow members. Never listen to the man who comes to you with a yarn running down your neighbour. He will do the same about you next week. If we treat each other with respect, the public will follow suit. Loyalty to our profession comes naturally to most of us. It is exemplified by doing our humble best for every case, in not pretending to do more than we can accomplish, by disabusing our clients of the deep-rooted idea that we have a cure for every ill in a bottle, by teaching them a little of the true cause and prevention of disease, and not being ashamed to acknowledge that we do not know, when such is the case." (Applause).

Captain HAMILTON KIRK next proceeded to read his paper on "Some Aspects of Distemper." [This paper, and the discussion which followed, are reproduced elsewhere in this issue.—Ed.]

A hearty vote of thanks to Captain Kirk was carried by acclamation on the proposition of the Chairman. The HON. SECRETARY mentioned that he had received a balance sheet from the Hon. Treasurer (Mr. Whitley Baker), which showed a balance in hand at the moment of £5 6s. 6d. He noticed that no payment was made to the Victoria Benevolent Fund last year, and he understood that was really paid by their Treasurer out of his own pocket, so that the Society was really £2 2s. 0d. to the good. He proposed to have the accounts printed and they would come up for discussion at the annual meeting in March.

On the proposition of Mr. Pack, recognition was made of the hospitality of the President, Major Wood, in providing tea, this being coupled with an expression of sympathy with him in his illness and hopes for a speedy recovery.

On the motion of Major FACER, seconded by Mr. PACK, Salisbury was decided upon as the venue for the next meeting.

An interesting pathological specimen, handed round for inspection by Major Martin, was some water hemlock which, he said, had been responsible for the death of three cows at Christchurch.

J. FACER,
Hon. Secretary.

CARRIAGE OF CATTLE AT SEA.

Lord Bledisloe, replying to Lord Danesfort in the House of Lords recently, said the Ministry of Agriculture had issued an interim Order prohibiting the carriage of animals on the weather deck of any vessel of flush and spar deck type engaged in the Trans-atlantic trade. It was hoped that new regulations would be issued, before March 31st. It was also proposed to draw up regulations applying to the Irish trade. Their basic principle would be that no animal should be carried on the forward part of the open main deck, and that sheep only should be allowed to be carried on the bridge and sheltered decks during the winter months. Other improvements were contemplated.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest inclusion in these columns.

Diary of Events.

1927

Jan. 3rd.—Meeting of the Provisional Committee, N.V.M.A. at the Royal Clarence Hotel, Exeter, 2-30 p.m.

Jan. 5th.—N.V.M.A. Council and Committee Meetings.

Jan. 6th.—R.C.V.S. Committee Meetings.

Jan. 7th.—R.C.V.S. Council and Committee Meetings.

Members of Council, N.V.M.A. are asked to note that as the R.C.V.S. Council Chamber is required by the Royal College for Sub-Committee Meetings during the afternoon of Wednesday, January 5th, 1927, the N.V.M.A. Council Meeting has been arranged for 4-30 p.m.

This late hour has been decided upon in order to render possible the attendance at all the Meetings concerned of the members whose presence will be required at the R.C.V.S. Sub-Committee Meetings and the Council Meeting of the N.V.M.A.

Smithfield's "Big Day."

Smithfield Market had its "Big Day" on Monday, 20th. There were deposited for sale 13,125 hindquarters, and 8,209 forequarters of chilled beef, 13,200 carcases of frozen mutton and lamb, 1,752 sides of British beef, 1,000 carcases of British sheep, 912 sides of beef and 663 carcases of mutton from Birkenhead, and 480 tons of Scotch beef, mutton and lamb. In addition, there were hundreds of carcases of frozen and fresh pork, with many tons of poultry and game.

The exhibitions set up by Messrs. Swift, Armour and Morris were extraordinarily good. Amongst the thousands of visitors were observed Sir John and Lady Moore, Colonel and Mrs. Simpson.

This is a yearly sight which should be witnessed by all who are interested in the production of farm animals, and more especially by those members of our profession who have to conduct meat inspection as the cleanliness, grading and quality of the meat imported from Argentina constituted an object lesson to all who handle or control the handling of meat.

Personal.

Marriage.—Locke—Walker.—On Monday, December 13th, at St. Peter's Church, Levenshulme, by the Rev. F. Iliff, M.A., Richard Conway Locke, M.R.C.V.S., D.V.S.M., second son of Mr. and Mrs. G. H. Locke, Tatton Villa, Heaton Moor, Stockport, to Jennie, elder daughter of Mr. and Mrs. H. Walker, "Stamford," Sunny Bank Road, Longsight.

At a meeting of Council of The Knights' of the Round Table Club, held at Simpson's, in the Strand, on Wednesday 15th December, 1926, Major F. Hobday, C.M.G., F.R.S.E., F.R.C.V.S. was elected to fill the office of Constable, under the Order. The word is derived from the old French "Conestable" and from the late Latin "Comes stabuli" (Count of the stable). The Knights of the Round Table Club is the second oldest club in London and dates from 1720 A.D.

"Beware of Sweet Clover Hay."

Under the above heading, the *North American Veterinarian*, of September, 1926, reports the following note:—

"A South Dakota ranchman asked *Hoard's Dairyman* for advice as to whether he has any ground upon which to sue his veterinarian for damages sustained by the loss of twelve bulls which bled to death after castration. Twenty-five bulls were castrated in forenoon and by 7 o'clock in the evening twelve of them had died. A part of their roughage, it should be noted, was sweet clover hay.

"At this time, since the effect of sweet clover hay on the coagulability of the blood of animals is but a recent discovery, it is not likely that any court would decide against any veterinarian tricked into that unfortunate situation. In the near future, however, it will be well for veterinarians to be on guard, for it will be reasonable to pronounce such accidents a result of malpractice where sweet clover hay is fed and where no effort is made to determine coagulability of the animal's blood or to warn the owners of the dangers."

Durham M.O.H. and Tuberculous Milk.

Dr. T. Eustace Hill, the Medical Officer of Health of County Durham, in a report to the County Council, points out that it is important to note that inspections of cattle under Part IV. of the Milk and Dairies Order shall be carried out by a veterinary inspector, or other properly qualified veterinary surgeon. Powers are given to veterinary surgeons under Part IV. of the Order to inspect cattle, to require any cow to be milked in his presence, and he may take samples of the milk. He may also require that the milk from any particular teat shall be kept separate, and he may take separate samples thereof.

Dr. Hill states that he has discussed this Order with the County Veterinary Surgeon, and both officers are satisfied that it is most important that arrangements should be made for the systematic inspection by competent veterinary surgeons of all cows supplying milk for human consumption. "Evidence," continues Dr. Hill, "is constantly being brought to our notice that milk containing active tubercle germs is being supplied to the public for consumption with the result that a large number of persons, the majority of whom are children, are being infected with bovine tuberculosis, with disastrous results." Indeed, Dr. Hill considers that there is little reason to doubt that about 40 per cent. of the cases of non-pulmonary tuberculosis are the direct result of the consumption of milk containing the germs of tuberculosis. Apart from any action which may be taken by the County Veterinary Surgeon, the County Medical Officer proposes to take periodical samples of milk for the purpose of ascertaining

whether the germs of tuberculosis are present, and, with the approval of the responsible committee, he proposes to utilise the County Inspectors appointed under the Food and Drugs Acts.—*Local Government Journal.*

Mr. Guinness, the Minister of Agriculture, states in a Parliamentary answer that the total net cost of combating foot-and-mouth disease during the financial year ending March 31st, 1926, was £311,980, and for the period during the present financial year up to November 30th last, £169,983.

Farmer and Ministry of Agriculture Inspector.

For refusing to allow an inspector of the Ministry of Agriculture on his premises, Mr. L. P. Smith, of Blacon Point, Chester, whose farm is near the farm where there was a recent outbreak of foot-and-mouth disease, was fined 20s. at Chester Castle Sessions recently. The defence was that Mr. Smith was anxious to protect his herd from risk, and would have permitted inspection by an official not directly or indirectly in contact with an outbreak on a farm in the neighbourhood. Mr. Smith, however, had his herd inspected by a veterinary surgeon, and forwarded a clean bill of health to the Ministry. The Chairman said the Bench thought that in this case an outside inspector who had not been in contact with the disease might have been employed.

St. Dunstan's Report.

The Annual Reports of the work of St. Dunstan's have never been merely dry, official records of facts and figures, and the Eleventh Annual Report, which has just reached us, is another very human and interesting story of the year's work on behalf of sufferers from the world-war who must always hold a high place in public sympathy and regard. The report strikes a high note of optimism, and this is fully justified both by the splendidly consistent progress and content of the war-blinded men themselves, and the generous public support given to the work of the organisation. "When better times come," the report states, "we do not fear that we shall be unable to sell our men's goods, but until they do, we must ask for special assistance in this direction." The catalogue inset in the report, describing and picturing the useful and excellently-made goods in basketry, rugs, mats, netting and joinery, which these blinded workers produce, should bring a volume of orders which will make it unnecessary to put any brake upon their industry. There can surely be few British homes which will not be proud to possess some examples of this most practical "Victory Over Blindness."

The general financial position of the Organisation is eminently satisfactory. The accounts and balance sheets show a reasonable margin of income over expenditure, after allowing for depreciation and an allocation to a Fund set up last year to provide pensions for those war-blinded men who do not receive a State allowance. An interesting fact to note is that voluntary help in raising the necessary funds has been relied upon to an extent which has permitted a reduction of the paid collecting staff by no less than 35 per cent.—a policy which, although it has resulted in a reduction of gross income, must yet be considered one of true economy and in the public interest.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

The Proposed Alteration in the Students' Curriculum.

To the Editor of The Veterinary Record.

Sir,—As a member of the staff of the Royal (Dick) Veterinary College who, for over seven years, has been engaged in the teaching of Zootechny, Animal Management and the Principles of Shoeing, the recent correspondence in the *Veterinary Record* has been of more than passing interest to me, and at the outset I should like to state that I view with alarm the proposals that have been made to divide the subject into two portions, and relegate each to another already wide subject.

I can appreciate, perhaps better than most, the difficulties encountered by the city-bred student in acquiring ability and precision in the handling of animals, and, what is often almost as great a difficulty, the 'unlearning' of errors acquired from previous experience amongst domesticated animals. Students appear to be capable of sub-division into two *main* types: those in whom Zootechny inspires fearfulness; and those who treat it with the contempt born of familiarity. That there are exceptions, often brilliant, no one will dispute. To attempt to teach a class composed of such opposite elements, and instil such rudiments (for they can at best be only rudiments) as will enable the members to present themselves before the examiners with some hope of satisfying them, is no mean task. To do all this in a course extending to twenty hours—the minimum requirement of the Royal College—is impossible.

A recognition of these facts led to the arrangement which has, for some time, been followed at this College, of commencing instruction at the beginning of the second term, after the student enters upon his course of study, *i.e.*, while still in Class A. During his first year the student attends twenty lectures, and such demonstrations, visits to farms, etc., as can be arranged. Such a procedure serves a triple purpose: it encourages the student to acquaint himself with animals, and dispels the feeling of isolation from animals which might otherwise occur; it lightens the teaching in the Second year, and it introduces the student to a practical side of professional work which is often insufficiently realised, in quite good time for him to find out whether or not he needs to spend more time than he previously anticipated in fitting himself for the examination at the end of his second year. It might be even further urged that it enables such men as have an inborn fear of or dislike for animals to change their career in good time before they are too far committed. In their Second year, students receive a 60 hours course—fairly evenly divided between theoretical and practical work, giving a total of 80 hours instruction. And, to my mind, this is not too much. During such a course opportunity is given for considerably wider instruction than the minimum laid down by the Bye-laws of the Royal College; in addition to the regulations there, an introduction to the study of the British Breeds of Livestock, a description of the materials used for bedding animals, an account of the methods of washing animals, and dipping sheep, an account of stable vices and tricks, etc., etc. (none of which is provided for in the official syllabus of subjects), are given.

To consider the revision of the whole syllabus of subjects for the Membership course of the R.C.V.S. seems advisable; but to consider a re-grouping of this particular subject, as suggested by the Council, seems open to very serious objection upon several grounds.

Practitioners are agreed that when they seek assistants they do not wholly incline to the men who have gained great collegiate distinctions; they prefer men in whom ability to handle animals is coupled with a sound professional knowledge. To be able to trust an assistant to approach

and secure his patient with celerity and dexterity is important; *most* important some would say; it is at least as important as to know that he gained many medals. One takes the instance of the assistant first because the assistant of to-day is the father of the practitioner of to-morrow, and 95 per cent. of our students go into practice at some time or another. In other letters already published, the importance of the subject in veterinary practice has been further and sufficiently emphasised, and its place in veterinary teaching as a separate subject must be assured. To add it to the work of the Third and Fourth years would be to invite *neglect and encourage ultimate extinction*; there is a sufficiency of ground to be covered in the examinations of these years, and to add more would entail the imperfection of diffusion, and prejudice the whole; some part would, of necessity, suffer more than the rest, and it is not too much to say that it would most certainly be that which has in the past been called 'stable management'—a bad term. One more most important objection is that were the teaching to continue in the first two years as at present, and the examinations to occur in the course of the last two years, that is, at times remote from the time of instruction, the hiatus so caused would do nothing but confuse still further the already harrassed mind of the veterinary student.

At this stage the question may well be asked: What is the rational reconstruction that is necessary?

After careful thought, it would seem to me that were Zootechny, Animal Management, and the Principles of Shoeing normal feet, rearranged somewhat according to the following scheme, benefit would accrue to the student, to the teacher, and, what is most important, to the Profession as a whole.

In Class A, students might be instructed from the beginning of their course in the following subjects:—Approaching, handling and securing animals; the points of the horse, ox, sheep, and pig, conformation of the types of the various animals (heavy draught, light draught, saddle horses; beef, dual-purpose, dairy cattle, etc.); the British breeds of Livestock; and the elementary principles of breeding. No professional examination should terminate the course, the teaching to continue without a break into and during Class B.

In Class B, instruction should consist of an amplified and extended course, modelled on the existing course of the R.C.V.S. and including Shoeing. At the end of Class B a professional examination is to be passed along with Anatomy and Physiology, but failure to pass in this subject should not debar a man who has passed Anatomy and Physiology from entering Class C. At the next half-yearly examination he shall present himself for re-examination in the single subject, and shall pass it, either then or later, before presenting himself for the professional examination of Class C. Until such time as he shall have passed he shall continue to attend regularly the course of lectures and the practical work along with the regular students of Class B.

The minimum number of hours for instruction might be fixed at not less than ninety, *viz.*, thirty in the First Year, and sixty in the Second Year; and special demonstrations could be arranged as might be possible.

One cannot help feeling that, were it possible, a course in Elementary Agriculture might be arranged to replace the non-professional parts of the present First Year's subjects, with very great benefit to the members of the profession in general, and to those who go into practice in particular. Agriculture is rapidly becoming no more a 'rule of thumb,' but rather a science demanding as exact methods as any, and veterinary science is so closely related to it that the veterinary profession must have cognisance of its elements, at least, if it is to fulfil its place in the scheme of things.—Yours faithfully, WM. C. MILLER, M.R.C.V.S.

Royal (Dick) Veterinary College, Edinburgh.
16*th December*, 1926.

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TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I have been reading the letters published lately in the *Record* regarding the teaching of "Stable Management" and I ask the favour of an opportunity of putting forward my views as a student.

I do not know what the "Stable" classes are like in the other colleges, but, as taught in Glasgow, I found this class the most interesting of those in my first two years. It was a most practical class, and what I learned therein has been of great use to me while seeing practice.

A student or practitioner who cannot handle, in a business-like manner, the animals with which he has to deal, is unable to make thorough examinations, and certainly looks a fool, if he doesn't feel one, in the eyes of laymen.

Instead of merging this class into Hygiene, which is a big enough subject and still growing, I think that it would be much better for the student if he had a greater number of lectures in Stable Management. In the Glasgow College, instead of the 20 hours laid down in the curriculum, the professor gives 30-40 hours, doubtless because he realises that it is impossible to teach this subject in such a short time to students, many of whom have had little or no experience among animals.—I am, etc., A. THOMSON, (Class D student).

December 18th, 1926.

"An Undiagnosed Case."

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I have read with interest Major A. A. Pryer's article under the above heading in your issue of the 18th inst., and shall be curious to see what diagnoses are submitted.

It seems feasible to me that the symptoms were all directly attributable to "choking," or, otherwise put, to obstruction either in the pharynx or more probably the initial portion of the œsophagus. The gullet, of course, immediately over-lies the trachea in that position, and extensive obstruction—in, say, the form of a wad of dry hay—would produce dyspnœa, given the degree of swelling described. I suggest that perhaps not all the alarming struggling and falling were due to dyspnœa but, in part, to terror. The epistaxis, being double-sided, would be at any rate from a pharyngeal or post-pharyngeal source.

If my deduction is the correct one, it is obvious that the obstruction was later swallowed, resolution following.

The gangrene of the muscular tissue of the neck would certainly be due to pressure from a tracheotomy tube, which was too short in the barrel and the slight remaining cough to irritation of the tracheal mucosa from the same cause. The protrusion and elevation of the muzzle represent a familiar posture in cases of "choking," and great distress and anxiety are always evinced.—Yours faithfully, F. W. CHAMBERLAIN, M.R.C.V.S.

Cheam.

Epizootic Hysteria in Dogs.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Evidently the disease described so ably in your last issue by Mr. J. J. Collins, of Bowdon, is widely spread. Only a week before Mr. Arthur Whicher, M.R.C.V.S., Bexhill-on-Sea, showed me several cases actually suffering in the way Mr. Collins mentioned, and had called my attention to it a few weeks previously. From what I saw of the malady, it resembled very much the hysteria seen so frequently in puppies under six months old, and erroneously, but generally, termed "fits," epileptic fits, epilepsy, etc., which have quite another symptomatology and etiology. I had encountered an occasional case of this apparently "adult hysteria" during the past year.

As to the etiology of the complaint, that remains to be demonstrated. I cannot agree, however, with Mr. Collins that the cause is acute indigestion, which he considers is set up by colic. Seemingly he has mistaken the effect for the cause. One usually attributes colic to indigestion and not the indigestion to the colic. I hope others will, like Mr. Collins, record their experience of this hitherto unrecorded epizootic form of hysteria.

True hysteria is not rarely observed in the bitch nine weeks or thereabouts after her " heat."—Yours faithfully, HENRY GRAY, M.R.C.V.S.

Kensington,
20th December, 1926.

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TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I am very interested in the article by Mr. J. J. Collins, M.R.C.V.S. in this week's *Veterinary Record*. As a matter of fact, I had intended sending you an article to publish on the same subject.

It is only during the past two months that I have seen the condition in this locality. The cases—about a dozen—seen by me, show the symptoms so well described by Mr. Collins, except that I have not seen the defæcation or salivation (except in one case) noticed by him, but they frequently urinate. With these few minor exceptions, the cases have been exactly alike.

Two of my own dogs have been attacked and when the last one was affected, Mr. Henry Gray happened to be staying with me. That was two weeks ago. The dog had been in the room with us all the evening, but when being taken for a walk, was not more than fifty yards from the house when he showed the usual symptoms of what Mr. Gray described as " Hysteria." My treatment has been similar to that of Mr. Collins, but I have not found it necessary to keep the patient quiet for more than a few days.

All the cases seen by me have been in adult dogs, one being nine years old. Two dogs were affected, in the same house at the same time. When my own two dogs were affected, an interval of a week elapsed between the attacks.—Yours faithfully, ARTHUR WHICHER, M.R.C.V.S.

1 Albert Road, Bexhill-on-Sea.
18th December, 1926.

The " Trojan Bull " Case.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—In reflecting over the " Trojan Bull " case, I doubt if any person could pass a plain piece of wire down an ordinary cow's throat, let alone that of a very big bull: the naked end of the wire would puncture before being tolerantly received into the œsophagus. But envelop the end of the wire with a bolus, as of toffee, and the passing would be simple. The variety of foreign bodies which cattle swallow is infinite.

Some three years ago I had the opportunity to make an autopsy on a cow that I was called to see, and found *in extremis*—the exciting cause of the death was the base, with small portions of the sides, of a six ounce flat bott'e: this article being embedded in the surface of the liver. As regards the length and roughness of an article swallowed, a good example is one that came to my notice some twenty-five years ago when, in a field, I was shown a six months' old calf with about six inches of a bramble protruding from the mouth; in those days a piece of hose pipe was not, handy to ensheath the bramble, so I simply pulled it out, and found it sufficiently long for quite a foot of it to be in the rumen. The calf made a good recovery, but the peculiar way in which it winced bore strong testimony to the fierceness of the thorns of a blackberry bramble. If a calf would get down that article an adult (whose capabilities are renowned) would conquer a 22 inch wire.—Yours truly, G. H. WILLIAMS, M.R.C.V.S.

2 Langley Road,
Chippenham,
December 18th, 1926.

Material for Research.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Members of our profession may be called upon occasionally to destroy dogs or cats which, on some previous occasion, have had part of a limb amputated.

I should be very grateful if from such carcases they would send me all the four limbs, together with a statement of the animal's age at death, and its age at the time of amputation. The limbs should be wrapped in a piece of gauze soaked in 10 per cent. formalin. The cost of postage will be refunded on receipt of the parcel.

Would you be so kind as to assist me by giving prominence in your columns to this appeal for material.—Yours sincerely, TOM HARE.

Pathological Department,
The University of Liverpool.
December 15th, 1926.

Will a Dog Breed to a Wolf?

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—As regards this question, *The North American Veterinarian* has the following in its edition of November, 1926, page 75:—" Under favourable circumstances domesticated dogs interbreed freely with wolves, and produce fertile offspring. Dogs have also similarly bred with the jackals of Southern Asia, which correspond to our wolves. It is not unusual for the natives of northern North America to encourage the crossing of their trained dogs with wolves, this being supposed to result in superior staying qualities of the animals, although this is open to question." The authority for this statement is W. C. Henderson, Acting Chief, Bureau of Biological Survey, United States Dept. of Agriculture.

This view is also supported by Mr. George Jennison (*Manchester Guardian*, December 15th), Belle Vue Gardens, Manchester, in an interesting article. Buffon examined the question exhaustively. A Braque was mated with a female wolf, and four cubs were born, and these were bred together 10r three generations to discover the line of reversion which, as a fact, was towards the wolf, a pure race being potent over mongrels. The sledge dogs of North America to-day are tied out to get a cross from the wilds.—Yours truly, G. MAYALL, M.R.C.V.S.

Veterinary Observation and Human Medicine.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—With reference to the article under the above title which appeared in your issue of last week, I should be glad if you would allow me to correct the following errors that appear in the text:—

First page, second column, line 21, reading from the foot, for " no " read " a." In the same column, line 8, reading from the foot, for " alcoholism " read " alcohol." Page 1115, third line reading from the top, for " constitution " read " condition "

The fault, or rather the misfortune, in the matter of these errors, is mine, for although you kindly gave me an opportunity to correct the proofs, I was prevented by an attack of influenza from attending to the matter properly.—Yours faithfully, J. W. RAINEY, C.B.E., M.R.C.V.S.

34 Chester Terrace,
Regent's Park.
December 18th, 1926.

The Editor acknowledges the receipt of the following:—

Report of the Annual Meeting of the Yorkshire Division, from Mr. T. C. Hall, Hon. Secretary.

Annual Administration Report of the Bombay Veterinary College and the Civil Veterinary Department in the Bombay Presidency for the year, 1925-26.

Report of proceedings at the third annual meeting of the Central Provinces (India) Veterinary Association, from Major R. F. Stirling, Nagpur.

Communications from Mr. F. W. Chamberlain, Major G. W. Dunkin, Messrs. J. W. Hall-Masheter, J. Leyshon, G. Mayall, C. Parker, and Lieut.-Col. P. J. Simpson.

National Veterinary Medical Association of Great Britain and Ireland.

EDITORIAL OFFICE: 10 Cray's Inn Square, London W.C.1.

All communications relative to the literary side of the Veterinary Record must be addressed to the Assistant Editor, " Veterinary Record," 10 Cray's Inn Square, W.C.1